DOCUMENT RESUME

ED 149 979 SE 023 448

TITLE	Environmental Education, Values for the Future: Curriculum, Population, Environmental Ethics, Environmental Decisions, Economics, Ecosystems, Energy, and Technology. Packet K-2.
INSTITUTION	Illinois State Office of Education, Springfield.
SPONS AGENCY	Bureau of Elementary and Secondary Education (DHEW/OE), Washington, D.C.
PUB DATE	77
GRANT	IOE-551-2-75
NOTE	233p.; For related documents, see SE 023 449-457 and SE 023 459-465; Contains occasional light and broken type
EDRS PRICE	MF-$0.83 HC-$12.71 Plus Postage.
DESCRIPTORS	*Curriculum Guides; Elementary Education; *Environmental Education; *Instructional Materials; *Learning Activities; Population Education; *Primary Education; Resource Materials; Science Education; *Teaching Guides; Values
IDENTIFIERS	Elementary Secondary Education Act Title III

ABSTRACT

This booklet is one of a series in environmental education for students in grades K-12. Scientific literacy, a major goal of the program, is divided into seven concept areas: Economics, Ecosystems, Energy, Technology, Population, Environmental Ethics, and Environmental Decisions. Each of these areas represents a separate unit in the program. An introductory section gives the structure, goals, and guidelines of this program. Each of the sections is color-coded for the appropriate concept area. These sections contain behavioral objectives, appropriate subject areas, and activity options. Each option gives a listing of materials and resources, procedures, and discussion questions. There are numerous illustrations to assist the teacher. This booklet is designed for grades K-2. (MA)

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CURRICULUM

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GRADES K-2

ENVIRONMENTAL EDUCATION

A THEMATIC APPROACH WITH THREE PROGRAM INTEGRATIONS

ANTIOCH COMMUNITY SCHOOL DISTRICT 34

TITLE III ESEA

SE 023 448

The materials in this program have been developed pursuant to a Title IV ESEA grant from the Illinois Office of Education Grant #551-2-75.

The activity which is the subject of this report was supported in whole or in part by the United States Office of Education, Department of Health, Education and Welfare. However, the opinions expressed herin do not necessarily reflect the position or policy of the United States Office of Education, and no official endorsement by the United States Office of Education or the Illinois Office of Education should be inferred.

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ACKNOWLEDGEMENTS

In the development of any curricular program the results are only as good as the background and enthusiasm of those involved. Special recognition should be given to those individuals who have been involved from the beginning: Jim Corrigan, John Estep, Mary Kern, Gil Krahn, Bob Lipinski and Diane Loughlin. They have helped to provide the necessary continuity and consistency. We also owe much thanks to Luella Anderson, Sue Baron, Paul Boardman, Sue Campagna, Art Contois, Paul Epner, Marge Girten, Judy Hebenstreit, Charles Lindholm, Lucien McLean, Sandy McDonald, Dan Mikal, Arlene Molinarolo, Evelyn Nutter, Wayne, Ochwat, Tom Sittler, Jean Soby, Jo Williams and Bob Willrett. Each has contributed to the success of the program. We should also give recognition to the one hundred and eighty (180) teachers from the following districts:

Barrington #220
Emmons #33
Gavin #37
Grass Lake #36
Grayslake #46
Highland Park #108
Highland Park #113
Highland Park #111
Lake Villa #41
Libertyville #70
Lotus #10
Millburn #24
Mundelein #75
North Chicago #64
Oak Grove #68
Prince of Peace
St. Peter's
Stevenson #125
Warren High School #121
Waukegan #60
Woodland #50
Woodland Park #110

Without their recognition of the need for environmental education in their schools we would not have been able to conduct our pilot program in twenty-two school districts in Lake County, Illinois.

Without the assistance of these people and the guidance of the citizens advisory committee we would not have been able to accomplish our objectives.

The program as conceived by Superintendent Henry C. Meyer, William Herbst, and Mary Kern owes much to Dr. William B. Stapp for the basic philosophical groundwork upon which we have built.

Special recognition should also be given to Jane Craner and Gail Dubek for the artwork which appears throughout the materials.

We are also grateful to the outside experts who evaluated and suggested the revisions necessary for the program: Dr. Carl F. Berger, Dr. Malcolm Swan, Edward Clark, Virginia Stehney, Drs. Sonia and Robert Vogl, Judy DuShane, Gene Knight, Dr. Robert Sampson, Dr. Lance Bedwell, Donn Worling, and Dr. Bruce Dalgaard. Without their commitment to environmental education we would not have been able to obtain such high quality input to our program.

Michael D. Teeley
Project Director

PREFACE

We have organized this booklet and the teaching materials to make them as easy as possible to use. This booklet contains the basic program philosophy, an overview of all the themes and understandings, our recommendations for overcoming problems of implementation, guidelines for problem-solving, and a booklet on gaming and simulations. Additionally, we have prepared materials on field trips in Lake County, inventories of the Antioch environs, and values clarification guidelines.

You will note that the materials are divided into four grade levels; K-2, 3-5, 6-8, and 9-12. These divisions have enabled us to gear the concepts, understandings, and units to appropriate student ability levels.

We have divided the area of environmental literacy into seven major themes or concept areas; Population, Technology, Energy, Economics, Ecosystem, Environmental Decisions, and Environmental Ethics.

To facilitate their use we have grouped and color coded the materials. Each of the concept areas has a different color cover and all of the materials for that concept area are grouped in the single booklet with a single table of contents. Units may be selected from the table of contents or by using one of the indexes in this booklet.

We have also prepared the concept sheet so that you may find your particular grade level easily. Each level is highlighted in a different color on our master sheet. You should be able to see at a glance all of the understandings for your grade level.

While reviewing the materials please note the order of presentation: behavioral objective; subject areas involved; and the options themselves, three per understanding. The options are distinct and they will provide you with a variety of teaching methods. Explicit directions should make it possible for every teacher to make environmental education part of their teaching.

The pilot program has shown that the modified materials are very easy to use and provide a variety of experiences which integrate environmental education concepts into the existing subject matter. All that we ask of you, the classroom teacher, is that you expend the time and energy needed to select the activities which suit you best.

Environmental education cannot wait and we have attempted to facilitate your involvement.

INTRODUCTION

Since the industrial revolution man has found himself able to govern an increasing number of variables in his daily life. Each new "advance" has brought additional comforts and protection from the vagaries of an often harsh environment. Until the twentieth century, the rather slow rate at which technology brought about changes in lifestyle made it possible for man to comprehend and adjust to the changes. In the twentieth century world population has doubled. There has been a four-fold increase in the people and land in cities, social and technological changes, and environmental pollution have increased at a pace often too difficult to comprehend or even measure.

In 1970 there seemed to be an awakening of a significant portion of the population to the scope and nature of the problems to be faced. Teach-ins, rallies, resolutiosn, and commitments all indicated that people were alarmed and eager to work to resolve the problems of our environment. When the emotion of the period died, there remained relatively few individuals and groups with a long term commitment to dealing with the problems.

Now that the work of these few individuals is resulting in legislative action, new enforcemnt standards, and conflicts between economics and ecology, more people are being forced into action. Individuals must weight the cost of pollution control equipment, as seen in higher priced cars, electricity, and other manufactured goods, against the benefits of cleaner air and water.

To make informed and consistent decisions every citizen must have the opportunity to gain the insights and experience only a strong environmental education program can offer.

To this end, Antioch Community Consolidated School District 34, Antioch, Illinois, working under a Title III ESEA (now Title IVC) grant has developed a kindergarten through high school (K-12) environmental education program.

In the earlier grades the program focuses on heightening student awareness of the world around them and increasing their sensitivity to the interactions taking place there. Their new awareness is used to help them to begin to understand their place in the environment and the importance of each aspect of our world.

As the child progresses through the program in the elementary grades this interest and awareness is utilized to help them begin to understand the intricacies of the many interdependencies and changes taking place in the environment. They also begin to get a feeling for the scale of their world and their place and responsibilities in it.

At the junior high level activities focus on the integration of content with the problem-solving skills necessary to put their developing environmental ethic into meaningful action.

During high school, activities are designed to refine their problem-solving skills to enable them to handle the problems of trade-offs and the increasing complexity of large scale community problems.

PROGRAM GOALS

The broad overall goals of the program are to create student-citizens who:

* possess a vital interest in their environment,
* are sensitive to even subtle changes in the quality of this environment,
* are able to understand, analyze, and evaluate problems,
* are skilled problem-solvers and
* are motivated to act in the resolution of environmental problems.

Within these broad goals a number of supporting objectives and approaches have been established:

* Increase student sensitivity to the environment through firsthand discovery and inquiry.
* Increase student interest in the environment by integrating environmental education into existing subject matter on a regular basis.
* Increase student knowledge in areas that are necessary for participation in the resolution of environmental problems.
* Increase the ability of students to recognize existing and potential problems in the community.
* Increase student problem-solving ability through carefully monitored personal problem-solving experiences.
* Increase student motivation and desire to become involved in the affairs of the community through successful experiences with community action activities.

PROGRAM STRUCTURE

For any educational program to be effective it must clearly identify those components of learning which will be part of the program. We have identified three principle areas of concern for our program:

COGNITIVE - The factual information related to understanding man's interrelationship with the environment. An environmentally literate citizen should be capable of understanding the broad areas of concern associated with environmental issues and problems. The program structure is designed to relate separate disciplines to each other as they relate to developing an understanding of the scope of environmental issues.

AFFECTIVE - The emotional response of individuals to their environment. For an individual to be consistent in his response to environmental issues he must have a thoroughly thought out system of values. An important aspect of the program is the provision for numerous opportunities for the student to evaluate and modify his values to ensure a value system consistent with individual and societal needs.

PROBLEM-SOLVING - This action component integrates cognitive and affective areas into meaningful activities. To solve environmental problems we must have a citizenry that is not only knowledgeable about the environment but motivated and skilled in dealing with problems. The problem-solving component develops the skills and provides the reinforcment necessary for students to become involved in environmental issues.

To facilitate the development of these components we have structured the program in the following manner:

- Spanning and integrated into the existing grade levels and subject areas.
- Linking subject areas that relate to environmental concerns (interdisciplinary approach).
- Emphasizing the role of the student in the learning process.
- Placing emphasis upon the role of the individual and the need for examination of individual attitudes and values.
- Providing opportunities to develop the critical thinking and problem-solving skills necessary for action.
- Emphasizing social change strategies and the necessity for removing emotion from problem-solving.
- Focusing on the local environment and resources, while not neglecting regional, national, or world issues.
- Emphasizing the future of man and societies.

As the students move vertically through the educational process, K-12, the curriculum will incorporate the above points and aim for a strongly integrated and cumulative program that develops students within our overall program goals who are:

<u>sensitive</u> to and <u>aware</u> of the environment,

<u>interested</u> in and motivated to become involved in usses,

skilled <u>critical thinkers</u> able to recognize the root cause of problems and

skillful <u>problem-solvers</u>.

CONCEPT AREAS AND UNDERSTANDINGS

The environmental education program has identified seven (7) major concept areas and one hundred sixteen (116) understandings aimed at K-12 competence in each of the seven concept areas. These understandings will assist both teachers and students in identifying important understandings related to environmental education. Briefly, the seven concept areas and their foci are:

ECOSYSTEMS - In any program for environmental education it is necessary to develop an understanding of basic ecological principles. All other concepts are dependent upon the student understanding the rules governing the operation of the total system.

We begin with the basic structural aspects of ecosystems, including component identification. From this we progress to explorations of their orderliness, interactions, and complexity. These are then incorporated into investigations of energy needs, a source, its storage, and the different forms of energy needed. The ecosystems are then analyzed to determine how energy is used at various points in food chains.

All of these aspects are then examined to determine the effect man has had on ecosystems and how our role must be altered.

POPULATION - To understand the scale of the problems to be dealt with, students must understand population principles. Any and all solutions to problems must deal with a scale governed by the population affected.

For the youngest student we begin by defining a population and its component parts. We then explore the differences and interactions of a variety of populations. Upon this foundation we

build understandings of the rate of growth and change of populations, the factors affecting changes and the past, present, and future of world populations. Students then explore the variety of alternatives available to us as we attempt to maintain or improve our environment on a worldwide basis.

ENERGY - One of the inescapable problems facing the world today is meeting present and future energy needs. Students must understand the source of energy, its forms, and the transformations necessary for us to use energy.

The program deals with the laws of thermodynamics in both the classical and practical sense. The student is shown the growing need for energy and the problems associated with each of the alternatives. Activities also focus on the time lag associated with bringing energy to the consumer in a form which is usable.

The most important aspect of the energy understandings is the recognition of the need for energy conservation. Conservation will help us to delay the effects of energy shortages while we are developing the clean forms of energy necessary for achieving the United States' goal of energy independence and environmental quality.

TECHNOLOGY - With the rapid advance of technology in recent years there has been a concomitant increase in our dependence upon technologists. Without an understanding of the multiple effects associated with any application of technology we are likely to begin a cycle of events with far-reaching undesirable consequences, as in the case of pesticides.

The technology understandings begin by examining labor and waht we receive for our efforts. Students then examine the changes which have taken place and the influence of these changes upon

our lifestyle. This is then examined for the effects of technology on our use of resources. The student then examines the role of technology in determining our needs and the social costs associated with meeting these needs. The culmination of this topic is the identification of the role of the individual in identifying the trade-offs and concessions to be made in the adoption of an environmentally acceptable lifestyle.

ECONOMICS - For any individual to become involved in environmental issues he must understand the basic principles behind our economic system. It is an inescapable fact that when the issues can be shown as being ecology versus economy, ecology will be the loser.

To sort out fact from fiction the individual must understand trade-offs, political economics, principles of maximizations, and the manner in which industry is able to amortize its costs over time to minimize the effects upon profits and lossess.

In the same respect, the individual must understand the need for a sound economy with sufficient jobs and capital. The student must investigate and be able to explain environmental issues in terms that make sense to all interest groups.

ENVIRONMENTAL ETHICS - For the student to effectively participate in environmental problems he must be convinced that his actions are consistent with the goal of a better environment.

The understandings incorporated into the environmental ethics materials encourage the student to examine his attitudes and values as they relate to this broader goal. The units provide exercises and tests of both individual and societal values.

These materials are designed to reinforce a value system oriented toward stewardship as opposed to use of the environment. Through the normal progression of the program the student examines, applies, re-examines, modifies, and reapplies his values as they relate to his environment. During this development process the student also broadens his perceptual framework to include the divergent value systems of others as they relate to the variety of societies within our ecosystem.

ENVIRONMENTAL DECISIONS - The singular most important segment of our program is the area of environmental decisions. This area brings together, in an action phase, all six of the other concept areas.

This action phase relies on the factual information assimilated in the other areas for the active process of making an effective environmental decision.

The student learns the problem-solving process and puts it to the test in real and simulated decision-making situations. This process integrates the content, the trade-offs, and the values discussed in the other six areas.

Within each of these seven areas the understandings and the teaching units developed for them have been divided into four major grade groupings, K-2, 3-5, 6-8, and 9-12. Each of these groups is designed to make it possible for a given unit to be utilized at more than one grade. This permits the individual teacher to deal with students of different abilities and at the same time limits the possibility of needless repetition of material. Additionally, each unit is designed to be used in more than one subject area and the most applicable areas are noted.

CONCEPT SUMMARY SHEET

	ECONOMICS	ECOSYSTEMS	ENERGY	TECHNOLOGY	POPULATION	ETHICS	DECISIONS
K-2	Money sources Money distribution	The source of energy Ecosystem definition The food chain	The source of energy Needs for energy	Responsibility for work Necessities and luxuries Effects of technology	Animals, people and plant communities Interaction and stress Satisfaction of needs	Needs of people Interactions within societies Values and society Scientific discovery	The nature of choices The responsibility for decisions
3-5	Income sources Economic sources Supply and demand	Ecosystem place Ecosystem energy Ecosystem interactions Pollution and ecosystems	Users of energy Forms of energy Conversion of energy	The effects of technology Influence of technology of lifestyle Rate of technological advancement Lifestyle and natural resources	Predictable population cycles Effect of lifestyle on environment Checks and balances in nature	The effect of lifestyles of the environment Human attitudes and environmental harmony Stewardship of the Earth	The nature of sound decisions The personal nature of decisions Consequences of decisions Time factors and decisions
6-8	Standard of living Economic systems Environmental economics	Ecosystem complexity Forms of energy in ecosystems Energy transfer in ecosystems Capacity for stress in ecosystems	Varying energy needs Energy losses The energy problem Energy forms	The effect of technology on environment The timeline of technological effects The effect of lifestyle on resource demand The effect of demand on the manner of resource use	Origins of population Standards of living Population interactions	Preservation of the natural order Man's role in the world The environment and psychological well-being Meeting future needs	Complexity of decision-making Effects of decisions Decision makers Enforcement of decisions
9-12	Economic systems Environment and economics	Ecosystem dynamics Ecosystem structure Humans and ecosystems	Energy use Energy transformations New problems New solutions	Influence of demand on cost Social costs of technology Technology and trade-offs	Characteristics of populations Population diversity Impact of population growth on resource use and the environment Social implications of populations	Diversity of natural surroundings Implementation of ethics Quality of life and social justice	Scope and aspects of decisions Decision-making and personal values The role of the group in decision-making The effect of laws on environmental decisions

IMPLEMENTATION GUIDELINES

Possible objections to Environmental Education and responses to these objections:

1. Objection

"This program is likely to get us away from the teaching of fundamentals."

Response

The three R-s cannot function in a contaminated environment. Furthermore, in a multi-disciplinary program the teaching of basics can actually be made more meaningful through their application to environmental issues and aspects of the children's world of interest to them.

2. Objection

"I have a required curriculum to cover. I can't work in any more material."

Response

In most cases this program can be used without time loss. These units are designed to teach curriculum concepts that are already required in most system. Here, however, the emphasis is on the environment. It is true that some of the options require more class time than others, but in these cases more than one concept will be covered. Furthermore, the Illinois legislature has decreed that Environmental Education be implemented throughout the state; and this program, it should be noted, has been approved by Title III ESEA.

3. Objection

"Our class periods are too short to accomodate a program of this kind."

Response

Many of the options can be easily covered within a single class period of average length. Where more than one period is required, the transition from one day to the next will present no more of a problem than it would in any other subject area.

4. Objection

"I'm afraid that the preparation time will be prohibitive, and I'm already overworked."

Response

Most of the preparation has already been done. In many instances a careful reading of the directions is the only preparation necessary. If time permits, of course, the teacher may choose an option that requires more extensive background study or the assembling of a greater number of materials. The choice is his.

5. Objection

"This program does not apply to my subject areas."

Response

Environmental Education deals with more than air and water pollution. It is concerned with the relationship between living things and their total environment. In the case of man, for example, the environment can be physical, economic, political, cultural, and the like. In other words, Environmental Education embraces virtually all areas of formal study.

6. Objection

"That's all well and good, but where the community aspects of the program are concerned, I would be at a disadvantage. I'm simply not that familiar with our local resources."

Response

Resource handbooks have been included in our package. Each school system is encouraged to develop its own handbook of local resources, using the Antioch handbook as a guide. Chambers of Commerce, sewage treatment specialists, police departments, recreation directors, and others can be very helpful in the compiling of such a booklet. If a school system is seriously interested in pursuing environmental studies, it should undertake the writing of its own resource manual at the earliest opportunity.

7. Objection

"What if I am absent? Will the substitute teacher have difficulty teaching these units?"

Response

These units should present no more difficulty for the substitute teacher than any other unit would. In fact, the procedures in these options are normally more detailed than those found in most lesson plans.

8. Objection

"It looks to me as though the format of these units provides for very little variety in method."

Response

The order and symmetry of the printed format is misleading. A closer examination will show that the total package calls for the utilization of all standard modes of instruction:

Lecture - demonstration
Questions - discussion
Drill and practice
Audio-visual
Problem solving and discovery
Laboratory - inquiry
Creative response
Role playing - simulations
Independent study - research

9. Objection

"Some of the understandings are unclear."

Response

If the teacher is familiar with the terminology of the understandings, he should have no difficulty in comprehending them. If, after such familiarity is established, an understanding is still confusing, we would appreciate having this brought to our attention for possible revision.

10. Objection

"I doubt whether my students are mature enough to make judgments of the type called for in most of these units."

Response

This is, of course, a genuine concern. However, the only way to foster mature thinking is to place the student in situations that require clear thinking. To this end we have included a values clarification booklet. This set of materials is designed specifically to sharpen student perspective, and this is where mature thinking must start.

11. Objection

"I question any program that tries to teach a system of values. Values are frequently subjective."

Response

These exercises are not designed to impose a value system upon the student but rather to help the student clarify his own values through carefully planned activities.

12. Objection

"Some of these options deal with controversial issues. I'm not sure that I would feel comfortable exploring these areas."

Response

Each teacher must decide for himself whether a given option is too controversial to be handled effectively in his district. The simple expedient of choosing a different option will normally enable the teacher to develop the understanding without colliding with local restraints or customs.

13. Objection

"I cannot encourage my students to become openly involved in community controversy. Because the members of the board of education are fearful of irritating their constituents, they would never permit students to question the city council or the chamber of commerce on such issues as waste disposal, pollution, landfill, or the like."

Response

One of the major objectives of an educational institution is to foster respect for the demoncratic process. As directors of such an institution, board members should be among the strongest backers of constructive democratic action. Our exercises are consistent with the goals of public education. If you follow the problem-solving guidelines you will not offend your board of education.

14. Objection

"We have a tight budget. I doubt whether we can afford to purchase the materials."

Response

The actual cost of the units is very small, and most of the options can be taught without additional cost. The purchase of games, filmstrips, and cassettes can be gradual. The district may expand its total supply of materials as finances permit, or modify the use of those already available.

15. Objection

"Without updating these materials will lose their effectiveness within a very few years."

Response

For the most part these units are conceptual rather than topical. To this extent the core of the program is not "dated". It is understood, of course, that individual teachers will continue to modify these materials over the years in order to keep them "fresh". In fact, totally new units might be added from time to time as the need for them arises.

16. Objection

"It seems to me that it would be extremely difficult to evaluate student progress in a program that is so subjective."

Response

Numerous evaluation tools are included within the individual units. There are discussion questions, theme topics, and pre and post tests. Also included are pre and post tests designed to span years of instruction. Personal values are no more difficult to deal with here than they would be in a typical Humanities class.

17. Objection

"The evaluation of the whole program, however, will be more complex. I am not sure I will know where to start."

Response

Carefully constructed evaluation forms have been included within the package. They should be quite adequate for the purpose.

18. Objection

"General resistance and apathy could seriously hamper our ability to implement this program."

Response

To fight resistance and apathy on the part of the community, the administration, the teachers, or the students, a number of steps can be taken:

Community

1) Send an information letter during the first week of school to inform parents of their son/daughter's involvement in the Environmental Education program.

2) Hold evening parental information sessions early in the school year to inform and involve the parents.

3) Encourage teams of parents, students, and teachers to become involved in community-based encounters.

4) Send newsletters to parents informing them of future field trips and progress being made in the program at their school.

5) Whenever possible work through community organizations on publicity and resources.

Administration

1) Clarify the position of the administration toward environmental education to determine how firmly they are committed to the environmental education program.

2) Hold information sessions for all administrators to update them on the environmental education program and to establish a feedback and evaluation network at the administration level.

3) Investigate the possibility of more flexible scheduling where necessary, i.e. year-round school, team teaching, modules, etc.

4) Develop a more reasonable field trip policy for schools involved in the environmental education program.

Teachers

1) Enumerate and clarify the long-range goals and sub-goals of the environmental education program.

2) Provide a staff co-ordinator to assist teachers in the implementing of the total environmental education program.

3) Co-ordinate requirements of other programs with the needs of the environmental education program to avoid duplication of field or encounter experiences.

4) Provide teachers with financial remuneration for attendance at workshops.

5) Keep the community well informed on the objectives of the program in order to allay teacher concern over the discussion of attitudes and values.

Students

1) Let students make choices. Help them to establish a positive vested interest in their school and community.

2) Provide students with problem-solving opportunities, by letting them choose the areas they wish to investigate and by encouraging encounters in the field.

3) Help the students use their experience to build upon classroom concepts.

4) Help the students develop greater perspective in the implementing of change strategy.

GUIDELINES FOR PROBLEM SOLVING

Realizing the importance of problem-solving to our environmental education program, we must first delineate some guidelines to be observed in order to be truly effective in the community. These guidelines are not intended to restrict problem-solving but to aid in the tactful and educationally productive involvement of students in school and community affairs.

The structure for effective problem-solving can be seen as a six step process with a seventh, evaluative step added for educational purposes.

DEFINE THE PROBLEM OR ISSUE

This step, while not the most difficult, may be the most important phase of the entire effort. We must clearly define the precise issue and not the symptom of the problem. We should not permit ourselves to get lost in an emotional approach to a symptom and in the process overlook the root cause. The role of the teacher at this point is to maintain the educational analytical attitude toward the entire process. Problem-solving is not a diversion, but a learning experience that is part of the regular school program.

> The local government wants to place a sanitary landfill in a marsh west of town but in the village limits.

BECOME INFORMED

This can be both the most laborious and most interesting phase of the process. During this phase students must learn about all sides of the issue and, using critical thinking processes, attempt to separate fact from fiction. This may mean using a variety of information sources from technical reports to firsthand interviews of citizens. A note of caution at this point. If the most effective means of data gathering means bringing in experts or going out in the community, be certain that you have cleared this with the administration beforehand. In public institutions we must be aware of the dangers involved in dealing with controversial issues. Be certain that your purpose is clearly defined and the program carefully monitored. An important aspect of problem-solving is sensitizing the problem-solvers to the attitudes and mores of the

community. Also, if the students will be conducting surveys in the community, be certain to publicize the event well in advance and clearly identify each student so that they are expected and are not seen as intruders. It goes without saying that the structure of the questions and the appearance of the students should also be carefully considered.

AGAINST

1. People near the site don't want it because it is noisy and they think unsightly.
2. The local conservation group complains that the marsh is a good hunting and fishing place and they don't want to lose it.
3. Local residents downstream are afraid the loss of natural drainage will cause flooding.
4. Research shows the exact dangers of landfill are not completely identified.
5. County health officials say there is danger to local wells if the site is not made properly.
6. The county soil conservation district says the site is unsuitable for a landfill.
7. Research shows the landfill takes five to ten years to cause damage to water supplies, if at all.
8. Government offices oppose the site if any better site is available. Site availability is left up to the village officials.
9. The local area is part of a large state and federal program to clean up local bodies of water.

FOR

1. The company running the site is one of the largest and best in the country.
2. The company will give half of the site to the city for a park when finished.
3. The village trustees feel the site is the best one for their needs.
4. There is no conclusive data proving pollution.
5. The village needs a site close to town for dumping wastes.

6. The closest site is more than eight miles from town.

7. Surveys of residents show most care very little about the issue.

IDENTIFY POSSIBLE SOLUTIONS

Once the students have a well-defined, well researched problem, they should be able to identify some potential solutions that will have a degree of merit. Some of these may be more functional than others but they should in some manner remove or eliminate the problem. At this point you should use value clarification strategies to begin to rank order these alternatives prior to final selection and development of a plan of action.

1. Close the site and force the users to find a new site.

2. Clean up the site and give them permission to operate under close control.

3. Expand and manage the site and deal with flooding and pollution when and if they occur.

4. Give the operators six months to develop enough facilities to eliminate problems.

5. Close the site and negotiate a new contract for an alternate site at higher cost.

6. Educate the community on ways to reduce garbage and close the site and use an alternate site.

SELECT AMONG ALTERNATIVES

At this point the students are going to select what they feel is the most efficient and tactful solution to the problem at hand. Be certain that you have decided on a plan of action that "fits" the community. Long lasting and effective change occurs only when the solution is accepted by the group(s) affected. The solution must also fit the capabilities of the students involved in implementing the plan. At this point you may find you have two or three plausible alternatives that may be equally effective. If this occurs you may want to select more than one and develop a comparative study to maximize your chances of success.

Among the six alternatives identified, there were only four with any long range merit. These were ranked according to what the students felt would have the most benefits for the community.

1. Educate the community on ways to reduce garbage and close the site and use an alternate site.

2. Give the operators six months to develop enough facilities to eliminate problems.

3. Clean up the site and give them permission to operate under close control.

4. Close the site and negotiate a new contract for an alternate site at higher cost.

The choices each have good and bad aspects that must be dealt with. The best alternative based upon community attitudes seemed to be #1. This was also the alternative the students felt best equipped to handle.

DEVELOP AN ACTION PLAN

To really bring the process to fruition you should make a point of developing a plan to implement the selected alternative. This is the format for the public action phase of the process and should be carefully laid out to consider the resources and abilities of the students as well as the community affected by the plan. Also be certain to involve as many community groups as possible.

The main aspect of the plan selected requires that the community be shown ways to reduce their garbage output so that the higher cost of the new disposal site will not be felt by the taxpayer.

The educational program will focus on local newspapers and the schools. The points of the plan are:

1. Encourage consumers to use returnable bottles.

2. Start a program to recycle glass.

3. Organize a program for regular paper drives.

4. Provide homeowners with information necessary to start home compost heaps.

5. Encourage and organize homeowners to recycle tin and aluminum cans.

6. Provide incentives for reducing the amount of waste picked up at the home.

IMPLEMENT THE PLAN

The implementation of the plan is usually the easiest step in this process, providing the first five steps have been well done. It is also the most rewarding for those involved. This phase produces publicity and elicits public reaction to the students, the school, and the teacher. If you have carefully monitored and assisted the students and everyone has done their job you will find that the overall reaction will be positive.

> Everyone is involved in the implementation of the plan. Students prepare new releases for the local papers. They prepare a number of posters for reminders of recycling and the program goals. The village board prepares a resolution to encourage recycling. Local businesses make more returnables available. The local newspapers publish reminders to the public.

EVALUATE THE PROCESS

This step is optional due to the possibility that an on-going evaluation may have been taking place during the first six steps. However, because this is an educational task with an educational objective it may be especially productive to review the process which took place and to point out the strong and weak points in the approach. Carefully done this can help to encourage further activities and produce a more educationally rewarding product.

> The students must evaluate their program. This usually takes the form of written and/or verbal means. It is best to keep this time open and let the students air their differences.

Throughout the problem-solving process we should be aware of the real purpose behind having students become involved in community affairs. We are not trying to correct all the wrongs of the community or to pinpoint blame. Our major goal is to help students to become effective, highly motivated and highly skilled problem-solvers. This may take many field experiences or one, but each experience should be carefully structured within our educational goals.

GAMING AND SIMULATIONS

INTRODUCTION

One of the most difficult problems for educators is the type of approach to be taken in introducing subject matter. Stimulating student interest, holding that interest, and leading the students to ask beneficial questions are aspects which the teacher should always keep in mind. A solution to this dilemma is achieved through the use of games in the classroom.

The connotations of the word "game" create within the students an immediate interest and enthusiasm not elicited by many of the other types of learning activities. The teacher benefits from the start. He further benefits by seeing the participation of students who normally may not get involved. A by-product is the marked reduction in student behavior problems.

The picture is not completely one-sided. Disadvantages do exist but in most cases they are outweighed by the advantages. Depending upon the type of game all students may not be able to play at one time. Noise level in the classroom may become high even though this noise is due to participation not the lack of it. Other advantages and disadvantages depend upon the type of game being played.

At this point we should explain what games are. Many different definitions of games are available. We shall consider a game any activity involving one or more players that has a fixed set of constraints placed upon the players with a specific goal or goals in mind and some sort of end point. The number of constraints may vary from a loosely structured game to a highly structured game. In the latter a pre-determined outcome is predictable

with little or no thought required of the players for that outcome. The learning in this type of game takes place in the ensuing discussion. The specific educational purpose may be anything from a general objective for the game to a specific end point to the game. In the former type an end point exists although it is not easily determined and this end point can vary each time the game is played. Clearly, there is a great amount of variety in the types of games on the market.

We feel that the benefits of games may have been overlooked as a source of learning. They may afford just the approach educators have been looking for. Direct student involvement makes student feel more comfortable in handling new topic areas and removes inherent fears of facing unexplored materials. We believe that one of the best ways to learn about a topic is to "live" through the experience; games provide these experiences in a safe, practical, enjoyable and usually economical manner. It is the purpose of this booklet to bring teachers up-to-date on educational games; the different types available; the advantages and disadvantages of each type; and short descriptions of actual games on the market.

TYPES OF GAMES

The simulation game can be used to do three major things - (1) present information; (2) elicit responses or provide a situation for practice; (3) assess performance and evaluate feedback. Within the scope of these parameters lie a number of advantages and disadvantages which the classroom teacher should be aware of.

Advantages of simulation games are numerous and they combine the great appeal of relevance with immediate feedback for the student. In the laboratory setting he may encounter real life conflicts in microcosm and learn to deal with them intellectually. The game makes certain social phenomena more observable to the student. Alternative courses of action are tried and discarded by him. Implications of these actions may immediately be discussed. Choices are weighed and tested. Rational decisions are fostered above emotional reactions. As such, the game is especially well suited to the decision-making process in the classroom. Real-life situations may be compressed within the time and space of a class period. Perhaps the leading characteristic of the simulation game is its ability to bring about high student motivation. Classroom teachers tend to value this advantage most highly, as so many positive student behaviors follow from it.

There are a number of disadvantages to be considered. Students may focus on the game element itself rather than upon the concept it is meant to reflect. Following from this idea is the criticism that simulation games oversimplify real life situations. Simulation games are frequently time consuming and may require teacher training. However, properly trained teachers with a willingness to devote adequate time to play and discussion will eliminate most of the disadvantages listed above.

The other large category of classroom games being marketed is non-simulation games. This term covers a broad range and generally refers to games in two specific ways: Many are not open-ended or they are open-ended in a uniquely different way. There is a

specific plan to them and a pre-determined manner in which the game should be ended. Non-simulation games are played in accordance with the rules of a given subject area. For example, a math game would be played by the rules of mathematics. The subject area most often imposes its own structure in non-simulation games. The rules, then, do not simulate the rules of the subject area - they are its rules.

The advantages of this type of game are like those typical of the first category - highly motivating, relevant, and capable of leading the student through the decision-making process. Students who have failed at regular classroom activities, often find success in playing non-simulation games.

There are several disadvantages to this type of game as well. The teacher must have a thorough knowledge of the rules involved and must be an effective guide to the students. The familiarization process may take time. The playing time of the game may also be long. If this specific amount of time cannot be allotted, the success of the game may be jeopardized. These disadvantages may be overcome by careful planning. A more difficult problem to cope with is that of the student who tends to over-emphasize winning above all other objectives in the game. Without the care and sensitivity of the teacher in this matter, the educational value of the game may be overlooked.

Simulation and non-simulation games may be presented in a variety of ways. Some are played on a board; some are not. The format and equipment of a game, the number of players who may play, and the roles of these players will depend upon objectives and rules of that game. At this point we should briefly mention role-

playing in more detail. There are three basic types of role-playing commonly used by simulation and non-simulation games. The first is free-form role play. No specific roles are assigned. The players are free to pretend to be whomever they wish. The second is limited role play. Specific roles are assigned to the player, but personality characteristics are not specified. Players might have such roles as laborer, sea captain, father. The third is assigned role positions. In this category the role specifications detail what kind of person inhabits the given role, for example: Laborer - with a grudge against management. In most games in which role-playing is used all players know what the assigned roles are and which players possess them. In some games, however, a person may be assigned a role which only he knows about. This is a source of mystery to the others in the game and, as such, may invoke distrust and outright hostility from his team members.*

If role playing is used in a game, it is used to serve the objectives of that game.

Besides becoming familiar with the many available educational games and their uses, teachers will benefit from learning to design their own games. Through a formula of specific steps most classroom objectives may be built into a game which will apply directly to a given classroom and the specific needs of a given group of children. Game design may be developed by adherence to these steps:

(1) Statement of the overall objectives to be taught;

(2) Determination of such elements as duration of the game and issues to be covered;

*This type of role play would be uniquely that of a catalyst.

(3) Identification of the individual groups or organizations who will be making the critical decisions;

(4) Determination of players' objectives - power, wealth, influence - in the context of the game;

(5) Determination of the players' resources - physical, social, economic, political, informational;

(6) Determination of the desired flow of resources and information to and from each player;

(7) Statement of what criteria or decision rules will decide how information and resources will flow among players;

(8) Identification of outside forces on the roles of players (Example: No violence permitted in competition among Quakers.);

(9) Formulation of scoring rules;

(10) Choice of form for presentation and manipulation of players' actions (board game, role play, paper/pencil exercise, computer simulation) and the sequence of operations to be used.

We suggest that both teachers and students become involved in the creation of new games or in the modification of old ones.

In order to further acquaint teachers with game models, let us give a detailed description of one representative game from each major category. Teachers may follow through the game procedures and analyze for themselves the outcome.

Planet Management is an example from the first category, simulation games. This simulation makes use of a "programmed data bank" that determines the composite results of the manipulations of the management factors on a closed planet. Players are able to "manage" the budget of the planet and allocate resources in a manner which they feel will effectively develop the planet. Within the structure of the game time is compressed and data from

succeeding rounds is displayed graphically so that the students can evaluate the success of their various decisions. Simulations of this form are very close to computer simulations. However, they avoid the mystery and expense of the computer while at the same time providing the variables of the computer program. These games are extremely successful due to their ability to be used by entire classes and to the minimal amount of time required to set them up and play them.

Community Planning Map is an example from the second category, non-simulation games. This open-ended game revolves around an 8'x8' vinyl floor map of the Toledo area. The major features of the area, rivers and expressways, are painted on the scale map and students, generally elementary, construct their own city around these features. This enables the students to show what they would put into a city and to explain why they think the separate components belong where they put them. This has the advantage of not forcing the students to follow any set pattern and also causes them to ask questions about the nature of their community. Once a community has been built, perhaps over a period of many days, the students are able to compare it to their community. Games of this type are very well suited for elementary grades because there are no rules and students can use their imagination and develop their powers of observation while at the same time learning about their community.

Redwood Controversy, a role-playing game, is an example from a third category, containing properties of both simulation and non-simulation games. Redwood Controversy involves students in the resolution of a land-use problem in a small community. To complete

the game the students must assume roles and, within the constraints of the roles, attempt to persuade others to adopt their position. Within the structure of the game the teacher can expect students to gain firsthand experiences in the areas of government, language arts, environment, biology, and communications. The open structure of these problem-solving games enables the teacher to bring in subject matter over long periods when students are at an impasse or to run the game in a single class period. These problem-solving games can be considered good starters for students about to become involved in problem-solving activities in their community. They can also be utilized to introduce a new subject area or the need for a new area of content.

These in-depth analyses of three games may serve to explain the basic game categories and to complete our discussion of the potential uses of games in the classroom. A more extensive game inventory follows. In conclusion, we recommend the use of gaming and simulation in the classroom as an alternative to traditional classroom methods and as one of the best ways of involving students in the Environmental Education Program in low-risk problem solving.

Balance — INTERACT

Grade: 5-College

Time: Three weeks for one hour each day

Players: An entire class

Format: Balance simulates the value conflicts facing the American family in dealing with the environmental crisis in our cities, by means of role-playing.

Concepts and Skills: The ecosystem concept, socio-cultural attitudes, critical evaluation of the extent of the environmental crisis and information retrieval and utilization. The game format also builds communication skills through individual presentation.

Business Strategy — AVALON HILL

Grade: 6-12, Adult

Time: 2-3 class periods (12 game months)

Players: 2-4 players

Format: The Banker gives each player, including himself, $10,000 in cash, four pawns of the same color and one sheet from the Running Record pad. Climate situation cards are shuffled and placed face down on the playing board. The game consists of 12 turns, each representing one month. The winner is the player with the most cash on hand at the end of the December turn.

Concepts and Skills: This game exposes the business world for what is really is. It parlays native shrewdness, common sense and proper management principles into the most relaistic game of its kind. It shows how to control the economy, how to protect yourself during labor strife, how to combat consumer boycott, how to avoid texes (legally) and how to be successful in business.

Clean Water — DAMON

Grade: 7-12

Time: 1-2 hours

Players: 2-4

Format: This is a board game designed to teach basic ecology through role-playing and problem solving.

Concepts and Skills: The basic ecological principles of an aquatic system and city planning related to the system are emphasized. Players learn the relationshps of various parameters upon an aquatic system.

Clug — UNIVERSITY OF MICHIGAN ENV. SIMULATION LABORATORY

Grade: 6-12

Time: 3 hours initially and one half hour for subsequent play sessions

Players: 15-30

Format: This is a board game with greatest emphasis upon role-playing and interaction.

Concepts and Skills: The game can be used to teach community land use, history, sociology, human relations, almost any area focusing on the city.

Communities in Nature (Ecology Learning Module) SVE

Grade: K-2

Time: Variable - This module may be employed as a full unit or portions of it may be used as supplementary to other science material.

Players: This module may be used by individuals or in small or large group instruction.

Format: The kit combines two games, eight sound filmstrips, four murals with vinyl adherents, one food chain chart, one food web chart, vinyl chart adherents, student discovery booklets and data sheets. The kit is a total learning experience with clearly worded teacher manuals to use as guides.

Concepts and Skills: The primary concept taught is that a community is made up of living things that affect each other. Related topics are distribution of energy through food chains and webs, community balance and the roles of plants and animals in communites.

Compacts INTERACT

Grade: 9-12

Time: 5-6 hours

Players: 30-40

Format: This is a simulation game which includes a Black Board and location of a Wall Newspaper. It might also include a portable P.A. System used to simulate radio or television news broadcasts. It also requires a Leader's table with issue cards, resources box, chance and unanticipated consequences cards, extra ART and proposal forms, additional instructional materials, badges, Community Directory, etc. Finally, it also includes a Mayor table with badges, role description sheets and sample forms. One might also use a table for coffee or other refreshments.

Concepts and Skills: Compacts has been used as a rehabilitation planning game nationally to train Federal and state administrators and planners. Compacts has been widely used as a "priming" game in many settings. Compacts has been successfully redesigned by participants to deal with neighborhood action; juvenile programs and the administration of criminal justice; community mental health; and community development.

Cope — INTERACT

Grade: 6-12

Time: 20 periods of fifty minutes each

Players: An entire class

Format: Cope simulates five future time periods in an imaginary think-tank city. After examining the problem of coping with change, students experience the stresses and anxieties caused by rapid change. Working to accomplish many tasks and to solve several problems, they face a future world's technology that is changing so fast that they have trouble keeping up with it. By the end of the simulation, students realize that the future is coming faster than they think and that human beings will have to learn to adapt and create in order to survive in this fast-changing world.

Concepts and Skills: The game teaches the student to relate in writing an experience-formed description of these concepts; future, change, adapt and cope. It also describes what future civilization will gain and lose by pursuing each of three alternative routes in two of the following categories; communications, language, transportation, production, entertainment, general life quality and innovative technology. The following skills are taught: writing a self-evaluation and group-evaluation of skills at coping with change; using a highly abbreviated simulation language called Future Speech; describing three strategies for coping with change and the stresses each causes.

Council — INTERACT

Grade: 6-12

Time: Fifteen class hours

Players: The entire class

Format: After students take a pre-test on their knowledge of local government, Council begins as students become citizens of the city of Riverstream. Their first task as citizens is to elect a city government. They file petitions for office, make campaign posters, give speeches and elect a mayor and five city council persons. These individuals form the nucleus of the city government. The mayor appoints a city recorder and the chairperson of the Riverstream Planning Commission. Other students receive identities as additional planning commissioners, city and state officials and concerned citizens.

The government and citizens now begin solving local problems. Council contains outlines for 20 problems facing the government.

A typical day has many activities taking place. The city council holds meetings with angry citizens; a planning commission attempts to zone new land; newspaper reporters cover all events; other citizens do research on future topics of the council.

Council concludes when students retake the pre-test and then hold a debriefing period in which they evaluate city government, local problems, proposed solutions and the simulation itself.

Concepts and Skills: The game teaches the concept of basic election procedure; responsibilities of local officials, functions of local government; typical local government problems; and the zoning process. The following skills are taught: organizing and delivering a speech to persuade; making decisions as an individual and within a small group and reading maps.

The Dead River — EDUCATIONAL GAMES HAWKINS & PLOUTZ

Grade: 7-12, College and Adult

Time: Five playing sessions or one sitting of about 4 hours

Players: 10-32

Format: This is a role-play, simulation game.

Concepts and Skills: The game uses and develops decision-making skills, knowledge of the social and human ecological problems of water pollution, a feel for cost-benefit considerations and a chance to simulate government-citizen interactions.

Dig — INTERACT

Grade: 5-junior college

Time: Five weeks

Players: The entire class

Format: In Dig, competing teams create secret cultures; artifacts are made that reflect these cultures. Each team buries its artifacts for the other team to excavate and reconstruct. A final confrontation reveals the accuracy of each team's reconstruction and analysis. This is a simulation game.

Concepts and Skills: This game teaches that all people, past and present, have shaped their beliefs and behavior in the face of universal human needs and problems; that the various elements of any culture are interrelated and cannot be understood without examining the culture as a whole; that the culture of any society is constantly being altered; that it is difficult to examine and interpret cultures different from your own; that art reflects the ideas and moods of a culture; and that individual effort and group success are closely interrelated.

Dirty Water DAMON

Grade: 7-12

Time: 1-2 hours

Players: 2-4

Format: This is a board game designed to teach basic ecology through role playing and problem solving.

Concepts and Skills: Players become acquainted with the complexities of controlling water pollution in local bodies of water, without indiscriminately restricting industrial activities. Cost of pollution abatement measures and dealing with overpopulation of certain aquatic species are dealt with.

Ecology: The Game of Man and Nature DAMON

Grade: 7-12, College and Adult

Time: 2-6 hours

Players: 2-4

Format: This game is primarily a board game. Learning takes place from debriefing for the most part rather than in the game itself.

Concepts and Skills: Students try to achieve a balance between man's activities and the natural environment, while advancing through the Four Ages of Development: hunting, agricultural, industrial and environmental.

Ecopolis INTERACT

Grade: 4-6

Time: Fifteen days

Players: The entire class

Format: Ecopolis begins with a simulation within a simulation. Students are "born" as insects, animals, Indians and pioneers living in an ecosystem existing in America over 150 years ago. While the instructor introduces certain ecological concepts, insects and animals move, die or adapt to the changing environment being reshaped by growing numbers of westward-advancing and technology-carrying American pioneers. Those who survive in the ecosystem receive bonus points at the beginning of the actual simulation. But prior to moving into Ecopolis (a large American city and suburbs built upon the ecosystem which they have just experienced) students complete a survey of what they know about Ecology and the American environment.

Concepts and Skills: The game teaches the concept of the ecosystem, how man's attitude toward his physical environment shapes and changes that environment, the degree of pollution in America, its causes and possible solutions, the problem of overpopulation, how serious it is, what does it mean and what should or should not be done about it. The following skills are taught: outlining material; notetaking; using material provided to support general statement; role-playing; and defending a point of view in front of a group.

The Energy-Environment Game — EDISON INSTITUTE

Grade: 9-12, Adult

Time: 5-7 days (Teachers have reported great success in 7-10 days)

Players: 32 or an entire class

Format: This is a simulation/role-play game which includes detailed assigned roles and considerable resource materials (film-strip, record, spiritmasters, wall map, site selection information and related reading matter). It attempts to teach that there are no easy, simplistic, readily available solutions to the problems that face us.

Concepts and Skills: The concepts of this this game involve analyzing objectively the ecological, technical, economic and political considerations and trade-offs in planning power plants and other energy-related problems of regional planning.

Environmental Realities INTERACT

Grade: 1-12

Time: 1-3 hours depending on amount of discussion between plays

Players: 4-6 players or teams of players

Format: This is a board game, played with real pictures, cards, a spinner and markers. All players are called upon to participate fully in discussion. A player proceeds to move around the board according to the yes-votes or vetoes of opponents.

Concepts and Skills: This game attempts to develop within students an awareness and appreciation of the realities of a modern city. It also exposes students to possible remedies for urban problems. Students are given opportunity to express values and to organize and evaluate ideas as they apply to the city.

Evolution: The Geologic Time Chart EDUCATIONAL GAMES HAWKINS & PLOUTZ

Grade: 5-12, Adult

Time: 40 minutes - 1 hour

Players: 2-6

Format: This game is played with a board, chips, markers and dice. The object of the game is for students to win by evolving into higher animal forms (preferably monkey or man) and by increasing his population.

Concepts and Skills: This game deals with animal life on earth. Players assume the role of animals and compete for existence, dominance and evolution into higher forms. Students learn the names of eras and periods in proper order along with animals that lived at each point in time. Evolution follows the most widely accepted time theories and is accurate to time and animals introduced within each period and era.

Executive Decision — 3-M BOOKSHELF GAME

Grade: 6-12, Adult

Time: 2-4 class periods (12 rounds)

Players: 2-6

Format: This is a board game in which students as top-level executives of a large corporation make monthly decisions regarding the purchase of raw materials and the manufacturing and selling of finished goods. Since prices fluctuate according to supply and demand, each decision the player makes affects the overall profits or losses of his corporation. Player who succeeds in making the most profit for his corporation is the winner.

Concepts and Skills: Students learn about the rule of supply and demand; decision making regarding the purchase of raw materials; the manufacturing and selling of finished goods.

Litterbug — DAMON

Grade: K-5

Time: Less than 1 hour

Players: 2-4

Format: This is a board game in which a student wins by the volume of trash he has collected from the board and therefore because he has done the best job of cleaning streets and sidewalks.

Concepts and Skills: Students proceed around the board collecting litter which they deposit in their trash containers. The object of the game is to keep the community clean and free of litter by depositing trash in proper receptacles.

The Lobbying Game — INTERACT

Grade: 7-12

Time: 3 hours

Players: 34

Format: This role-playing simulation is played in a large room with as many chairs as players, arranged to simulate a legislative chamber. Students are assigned roles, given materials and instructed to promote the submission of bills. Discussion and lobbying follow.

Concepts and Skills: The Lobbying Game teaches intricacies of the legislative process.

Making Your Own World — COCA-COLA COMPANY

Grade: 4-8

Time: Variable, three hours or as long as the teacher wishes

Players: An entire class

Format: This is a very flexible game designed to produce role-playing. With proper leadership all players participate.

Concepts and Skills: The game involves city-planning, critical thinking, problem solving, ecology, social interaction and role playing. This is a very visual game that involves everyone and can be extremely valuable for instruction.

New Town — HARWELL ASSOCIATES

Grade: 6-14

Time: Variable for different grades

Players: 2-4 per board

Concepts and Skills: Decision-making, problem solving, planning and environmental improvement

Format: This board game builds a number of situations which teach about community construction, government, planning, or cooperation for better government.

N-Trow-P ENVIRONMENTAL EDUCATION OFFICE

Grades: 6-9

Time: 20-40 minutes

Players: 3-6

Format: Board game with bean bag toss board

Concepts and Skills: The game teaches about entropy through a play strategy designed around energy flow through a community.

Planning the Human Community (Ecology Learning Module) SVE

Grade: 5-8

Time: Variable - This module may be employed as a complete unit or portions of it may be used in any order as supplementary to social sciences or life sciences.

Players: For small or large group participation

Format: The kit combines the Planning Game, the simulation game, eight sound filmstrips, and related resource material. The kit is a total learning experience. The filmstrips provide conceptual readiness for the simulation. The board game provides skills readiness.

Concepts and Skills: The primary concept taught is that any human community both affects and is affected by the natural environment around it. It also teaches students that trade-offs are required in order to preserve a high quality of life and to preserve the environment.

The Pollution Game DAMON

Grade: 7-12, Adult

Time: One to two periods

Players: 4-8

Format: This is a board game requiring students to make decisions which may or may not help to clean up the environment. They are forced to deal with rising air and water pollution which results as a byproduct of their moves throughout the game.

Concepts and Skills: The student will develop problem-solving, critical thinking, and appreciation for dealing with pollution problems.

Population: A Game of Man and Society DAMON

Grade: 6-12, College and Adult

Time: 2-3 hours

Players: 2-6

Format: This is a board game dealing with population.

Concepts and Skills: This game points out the balance, usually lacking, between population growth and resources that is so necessary for a country to avoid problems. The idea of a population explosion is graphically portrayed.

The Propaganda Game WIFF & PROOF

Grade: 9-12 (Teacher may wish to "water down" for use with eighth grade students)

Time: 1 hour or more (considerable additional time to be allotted for absorbing directions)

Players: 2-4

Format: This game is primarily played with idea cards and a clear thinking chart. Cards are drawn and students identify flaws and techniques of logic.

Concepts and Skills: In this game, students are led to become aware of the emotional overtones in all arguments and suggestions. They attempt to identify propaganda techniques while gaining control over their responses to the ideas they encounter daily.

Queries 'n' Theories — WIFF & PROOF

Grade: 9-12, Adult

Time: 1 hour or more (considerable additional time will be required for interpretation of directions)

Players: 2-4

Format: This game sequence is played with individual game charts, colored plastic chips and an egg timer. The rules are designed so that the play is a simulation of the scientific method.

Concepts and Skills: Students are introduced to some basic ideas of modern linguistics and the scientific method of inquiry. Theories are built and tested. Queries 'n' Theories is a series of games which move from the simple to the complex which can be played as a pure game or for "what it all means" in relationship to science and linguistics. It has the advantage of adaptation to students of unequal abilities.

Smog — DAMON

Grade: K-5

Time: 1 hour or less

Players: 2-6

Format: Hopscotch-type game where students hop around "town" replacing trash cards with beauty cards.

Concepts and Skills: The game deals principally with trying to get students to have positive attitudes toward substituting trash problems with beauty solutions of different varieties.

Smog — DAMON

Grade: 7-12

Time: 1-2½ hours

Players: 2-4

Format: This is a board game dealing with air pollution and city management.

Concepts and Skills: The students develop the skills involved in city management, decision making, problem solving, environmental management and critical thinking.

Stocks and Bonds — 3-M BOOKSHELF GAME

Grade: 7-12, Adult

Time: 2-3 class periods (ten game years)

Players: 2-8

Format: This game transports students to Wall Street. They shrewdly invest in the game's ten securities, buying and selling each year (each round) in an attempt to become the wealthiest stockholder in the game. The game has a unique calculator which tells students if they have had a Happy Monday or a Black Friday.

Stocks and Bonds is for two to eight players. The bookshelf case contains a stock board, marker, dice, calculator, record sheets, situation cards, stock certificates and instructions.

Concepts and Skills: Students become familiar with the many jobs of Wall Street. They become familiar with securities, buying and selling, and how to become rich or poor from the Stock Market. Students also learn the many terms used when dealing with Wall Street.

Stock Market Game — AVALON HILL

Grade: 6-12, Adult

Time: 2-3 class periods

Players: 2-4 (It may be expanded to include an entire class.)

Format: The Broker gives each player, including himself, $2000 in cash, ten shares of Blue Chip stock, ten shares of Speculative stock and five Trading Post discs of the same color. All remaining cash and certificates are kept in the "bank". The Broker goes through a series of moves and trend cards are shuffled and placed face down on the playing board. The winner is the player who has the greatest net worth at the end of Turn 12.

Concepts and Skills: The skills and concepts are somewhat similar to the ones learned in Stocks and Bonds. Basically, students become familiar with market terms; ways of making or losing money; the jobs of the Broker, etc.; and other skills when dealing in the stockmarket.

GAME MANUFACTURERS

Interact
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Harwell Associates
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APPENDIX

K-2 UNIT SYNOPSES

Economics 1: At the completion of this unit the student will be able to explain that money earned from work pays for our possessions.

Option 1 - The children use the story of The Ant and the Grasshopper to define the necessity of work.
Option 2 - The children experience money distribution through their choice of basic necessities, food, clothing, and shelter.
Option 3 - The children make choices in spending and budgeting for privileges within the classroom.

Economics 2: At the completion of this unit the student will be able to explain that everyone does not have the same amount of money.

Option 1 - Discussion of the meaning of payday clarifies the fact that everyone is not paid the same amount.
Option 2 - The children role-play the family as a consumer unit. Each family is allotted the same amount of money.
Option 3 - Each "family" group is allotted different amounts of money to spend on necessities and luxuries.

Energy 1: At the completion of this unit the students will be able to explain why the sun is the source of all energy.

Option 1 - The children use a game which develops the premise that the sun is the most important part of life.
Option 2 - Through the use of a game the children identify the sun as the source of energy upon which all life is dependent.
Option 3 - The students create a mobile with the sun as the most fundamental part of the life chain.

Energy 2: At the completion of this unit the student will be able to explain why all living things need energy.

Option 1 - The children use three plants under control conditions to explain how a plant receives energy from the sun.
Option 2 - The children resolve the problem that living things need energy with the use of an open-ended story.
Option 3 - The children personally experience how cold affects their need for energy.

Population 1: At the completion of this unit the student will be able to define a population so that it is of one type living in one area.

Option 1 - Students use leaves to identify some characteristics useful in defining a population.
Option 2 - Students use buttons to identify some characteristics useful in defining a population.
Option 3 - Students go on a walking trip to identify local populations of organisms.

Population 2: At the completion of this unit the student will be able to list three ways a population is part of a given community.

Option 1 - Students study communities using murals, filmstrips, and recordings.
Option 2 - Students construct a poster of community needs and interactions.
Option 3 - Students construct their own communities from a variety of pictures.

Population 3: At the completion of this unit the student will be able to list at least three ways in which populations interact with each other and their environment.

Option 1 - The students survey their parents to determine the importance placed upon the community.
Option 2 - Students interact with their environment with their eyes blindfolded.
Option 3 - Students use murals to identify the place of organisms in the community.

Population 4: At the completion of this unit the student will be able to list examples of how populations are affected by natural and unnatural influences.

Option 1 - Students plant seeds and see how the environment affects their growth.
Option 2 - Students select a study area and investigate it before and after they have had a disturbing influence on it.
Option 3 - Students compare the effects of man on four different study areas.

Population 5: At the completion of this unit the student will be able to list examples of how populations have located where their needs are most likely to be satisfied.

Option 1 - Students collect and study a population of ants and how they interact.
Option 2 - Students study the actions of earthworms in a small container.
Option 3 - Students interact in the selection of the community type that best meets their needs.

Technology 1: At the completion of this unit the student will be able to explain why in our country people are trained to perform various types of work required by society.

Option 1 - Children use the assembly line principle to perform individual tasks.

Option 2 - The children use a park layout to learn the functions of an area, then design their own park and discover what jobs are involved in the building and maintenance of recreational areas.
Option 3 - Children discuss why people work and the types of work after viewing various films on the subject.

Technology 2: At the completion of this unit the student will be able to explain why industry supplies both necessities and luxuries.

Option 1 - The children use catalogs and advertisements to explain the differences between necessities and luxuries.
Option 2 - The children make individual lists of necessities and luxuries, first within the classroom, then at home.
Option 3 - The children take a survey of necessity and luxury items in a store.

Technology 3: At the completion of this unit the student will be able to explain how inventions have made many changes in our lifestyle.

Option 1 - The children gather natural items to use in making simple tools.
Option 2 - Children use pictures to chart natural and man-made items.
Option 3 - The children use simple machines versus manpower to see how machines change our lifestyle.

Ethics 1: At the completion of this unit the student will be able to explain why people all over the world have similar basic needs.

Option 1 - Children use various media (story, filmstrips) to introduce them to the Pilgrim's lifestyle; the unit culminates with the preparation of Pilgrim food.
Option 2 - The children construct Pilgrim housing to identify with man's need for shelter.
Option 3 - The children construct Indian teepees to identify with man's need for shelter.

Ethics 2: At the completion of this unit the student will be able to identify contributions and benefits individuals make and receive in society.

Option 1 - The children use charted classroom duties to identify responsibility.
Option 2 - The children use co-operative squares to establish the benefits of working together.
Option 3 - The children interact cooperatively to see how they can benefit from others in society.

Ethics 3: At the completion of this unit the student will be able to explain that people have different value systems based on lifestyles.

Option 1 - The children see the clothing worn in different climates and compare it to their own.
Option 2 - The children use and prepare menus.
Option 3 - Through the use of categorizing the children define different values for objects with similar characteristics, in this case, books.

Ethics 4: At the completion of this unit the children will see through the study of snowflakes that there is much about the environment which we do not understand.

Option 1 - The children observe and compare snowflakes to find out that all are different. In the alternative option the children observe and compare leaves.
Option 2 - The children use prepared slides of snowflakes to observe and compare.
Option 3 - The children use different forms of water to discover similarities and differences.

Decisions 1: At the completion of this unit the students will be able to explain how decisions are choices.

Option 1 - The children make choices as a group and as individuals.
Option 2 - The children use their own experiences to decide what choices they make.
Option 3 - The children answer survey questions to make their choices.

Decisions 2: At the completion of this unit the students will be able to explain why environmental decisions can be made by individuals or by groups.

Option 1 - The children record their own menus for one week and make comparisons from a nutritional viewpoint.
Option 2 - The children use different sizes of products for economical and nutritional comparisons.
Option 3 - The children set up a classroom store for experiences in comparison shopping.

Ecosystems 1: At the completion of this unit the student will be able to explain why the sun is the basic source for all life in every ecosystem.

Option 1 - By the use of a simple science experiment the children will see water vapor form droplets caused by heat from the sun.
Option 2 - The children explain how heat from the sun is a form of energy through observation.
Option 3 - The children observe energy from the sun affects a change in water vapor.

Ecosystems 2: At the completion of this unit the student will be able to explain why the world can be thought of as one large ecosystem or spaceship with a number of smaller ecosystems making up its parts.

Option 1 - A classroom model of an ecosystem with water is set up and used by the children to explain an ecosystem.
Option 2 - The children use a spaceship as an example of an ecosystem and establish the basics needed to survive.
Option 3 - Chidlren observe a model of land plants and animals to explain the make-up of an ecosystem.

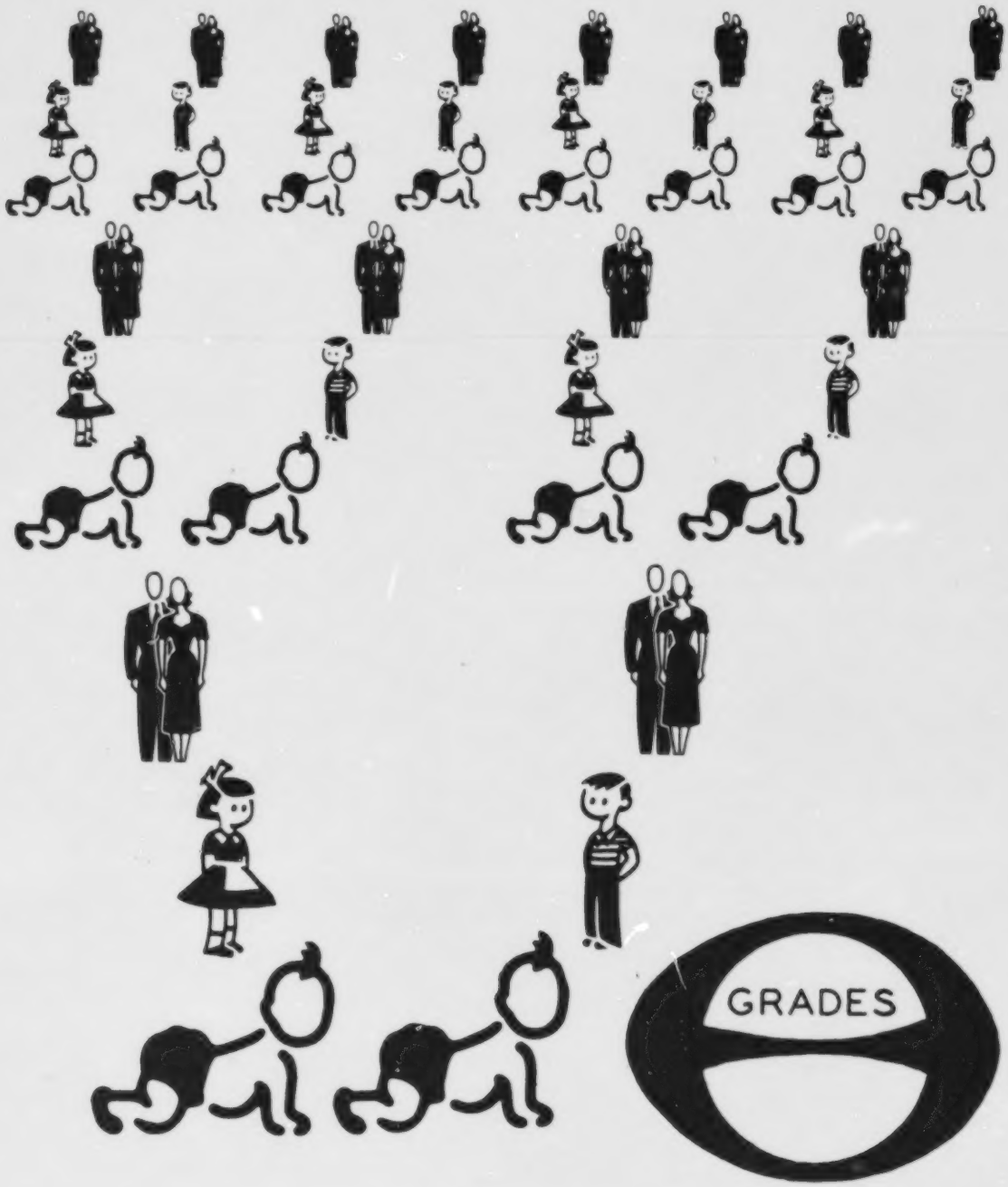
Ecosystems 3: At the completion of this unit the student will be able to locate an ecosystem.

Option 1 - The children use a forest mural to chart the animal that lives in a forest community.
Option 2 - The children use two murals, ocean, pond, or desert, to chart which animals live in that community and make comparisons.
Option 3 - The children draw a mural of their own locality and chart the animal life.

Ecosystems 4: At the completion of this unit the student will be able to demonstrate that some animals eat plants, some animals eat other animals, and some animals eat both plants and animals, like man.

Option 1 - The children observe in a controlled situation which animals eat plants and which eat animals.
Option 2 - The children categorize plant and animal eaters.
Option 3 - The children choose and study an animal on a school walk.

POPULATION



ENVIRONMENTAL EDUCATION

VALUES FOR THE FUTURE

ANTIOCH COMMUNITY SCHOOL DISTRICT 34

TITLE IVC ESEA

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Synopsis

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Population 3: At the completion of this unit the student will be able to list at least three ways in which populations interact with each other and their environment.

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Population 5: At the completion of this unit the student will be able to list examples of how populations have located where their needs are most likely to be satisfied.

Option 1 - Students collect and study a population of ants and how they interact. ... 27
Option 2 - Students study the actions of earthworms in a small container. ... 29
Option 3 - Students interact in the selection of the community type that best meets their needs. ... 30

EXPLANATION OF CONCEPT AREA

POPULATION - To study populations we must understand the variety of factors interacting on a global basis to make the area an important part of environmental education.

We begin by making students aware of the variety of populations and the steps they take to satisfy their needs.

In grades 3-5 we develop the idea of systematic interactions to provide checks and balances for population growth. We also explore the role of man and his lifestyle.

These are followed by the development of the concept of origins for life and the role of culture in determining population interactions.

In high school the student focuses on populations and their impacts as modified by culture and resource needs.

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to define a population so that it is of one type living in one area.

SUBJECT AREAS:

Mathematics, Social Studies, Science

KEY WORDS:

Population - the group of like organisms living in the same area

Organisms - any living thing, plant or animal

Community - a group of organisms, or populations in a certain area or space

OPTION #1

MATERIALS AND RESOURCES

Leaves

PROCEDURE:

1. Have each student collect ten different leaves from the neighborhood.

2. When the whole collection is together, put the students into groups of three to organize their leaves into populations.

3. Have them organize them in the following categories:

   Size* - e.g. 6 different sizes
   Shape - e.g. 10 different shapes
   Color - e.g. 4 different colors
   Texture - e.g. 5 different textures

4. When each group has completed part 3, ask them if each of the categories is a sign of a separate population. (*size is not)

DISCUSSION QUESTIONS

1. Did all of our leaves come from one area?

2. Is size a good way to select a population? Are we all the same size?

3. Is shape a good way to select a population of leaves? How about for people?

4. Is color a good way to select a population of leaves? How about for people? Are we all one color?

5. Is texture, how it feels, a good way to select a population? Do we all feel the same things on a leaf?

6. How did you divide your populations?

7. Are any of your lists the same?

OPTION #2

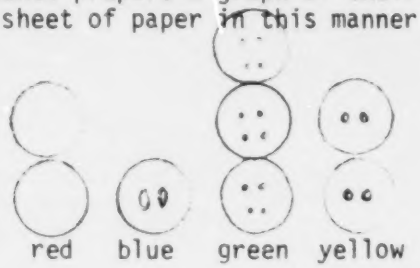
MATERIALS AND RESOURCES

Paper cups

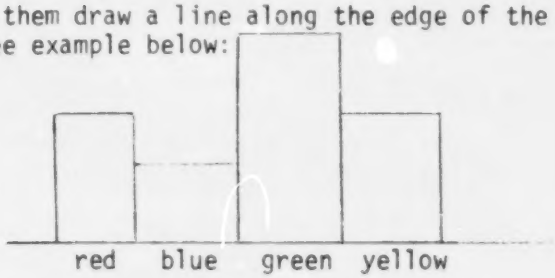
Different colors of buttons or marbles in varying quantities (same colors all alike in size, number of holes, and texture, etc.)

PROCEDURE

1. Divide the class into four or five groups.
2. Mix all the buttons and divide them unequally into paper cups.
3. Have the students divide their cup of buttons into populations. For example: This might be done by color or number of holes in the buttons.
4. Have the students prepare a graph of their buttons by placing these buttons on a sheet of paper in this manner:



5. Next have them draw a line along the edge of the top button in the graph. See example below:



6. Have the groups compare their results.
7. Try this again by trading cups of buttons.

DISCUSSION QUESTIONS

1. Do all groups have the same graphs?
2. Do any of them have the same lengths of columns?
3. How is your second graph different from the first?
4. Why did you separate the buttons as you did? Why do these buttons belong together?
5. How many populations did your group have?
6. What makes a population?

OPTION #3

MATERIALS AND RESOURCES

Chart paper and markers

School grounds, field or park suitable for a field trip

PROCEDURE:

1. Explain to the students that they are going on an observation trip in the neighborhood, school grounds, or park.
2. Divide the class into groups to count one specific subject and explain which column they will use to tally the subject.
3. Have the children record their data while on the trip.
4. Look at each other's charts and discuss them.
5. Define the word "population" for the class and write the definition on the blackboard.
6. Ask them which of their columns if any represents a population.
7. What other populations do they know of.

DISCUSSION QUESTIONS:

1. Who can tell me what a population is?
2. What animals did you see on the trip?
3. How many insects or dogs were there?
4. Were the insects alike/different?
5. Were the dogs alike/different?
6. How many trees/flowers did you find?
7. Were they alike or different?
8. Are trees, flowers, dogs or insects a population?

STUDENT DATA SHEET

OPTION #3

POPULATION 2

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to list three ways a population is part of a given community.

SUBJECT AREAS:

Social Studies, Science, Art, Language Arts

OPTION #1

MATERIALS AND RESOURCES

Communities in Nature, murals and filmstrips
The Garden, filmstrip and cassette
Study Prints; SP 180 & 181, Nature's Communities Forest & Pond SVE

PROCEDURE

1. Write the following words on the blackboard and discuss their meanings:

Community	Population	Animals
Plants	Garden	Water
Food	Air	Shelter

2. Discuss the different members of the garden population. Show one of the above filmstrips. Relate to the students that the garden is a community and that all the animals and plants are the populations of this community.

3. Have the students express what they feel makes up a good population by having them do a group mural depicting a garden community of their own creation and to have populations for it.

4. Discuss with the class what might have happened if the populations of the garden community were to grow. What would happen to available food supply?

5. Discuss what effects would occur if the garden community were not able to get enough water and sun.

6. Discuss the effects of care to the garden community.

DISCUSSION QUESTIONS

1. What are animals?

2. When we talk about a community, what do we mean?

3. How can we help the plants in the garden?

4. What things grow in a garden?

5. What is a population?

6. What is the population of this class?

7. What is the population of your home?

OPTION #2

MATERIALS AND RESOURCES

What Our Class Needs from GA media kit (everything fits together)

Crayons or grease pencils

PROCEDURE:

Part I

1. Display the poster for the class to see.
2. Fill in the blanks on the poster.
3. Point out how many needs come from the community.

DISCUSSION QUESTIONS

1. How important is the community to our class?
2. Could we live in any community? Why not?
3. What makes up our community?

PROCEDURE:

Part II

1. Have each student design or draw his/her community.
2. Compare and contrast pointing out the way the pictures differ and how they are similar.

OPTION #3

MATERIALS AND RESOURCES

Magazines depicting plants and animals

Scissors, cellophane tape and/or paste

PROCEDURE:

1. Have students cut out pictures of plants and anaimals from the magazines.
2. Make a display of these pictures.
3. Have the children write stories based on some of the pictures explaining why the pictures represent part of a population and its community.

DISCUSSION QUESTIONS

1. Why did you choose these pictures to represent your population?
2. What do your animals need?
3. Why were the plants necessary to the population?
4. What other populations are there?

POPULATION 3

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to list at least three ways in which populations interact with each other and their environment.

SUBJECT AREAS:

Art, Science, Mathematics, Social Studies

KEY WORDS AND DEFINITIONS:

Community - A group of organisms living in the same area.

Environment - The living and non-living things in and around organisms that they interact with

Interact - to affect or act on each other. Trees interact by providing shade and oxygen for organisms.

Organism - any living being, plant or animal.

Population - any group of organisms of the same type living in the same community.

OPTION #1

MATERIALS AND RESOURCES

Sample survey questionnaire and envelope for each student

PROCEDURE:

1. Prepare children for the survey by discussing - Why they think people choose to live in our community?

2. Record the ideas presented and explain we will be able to find out the real reasons why their parents came here by taking a note home for the parents to fill out.

3. Send the questionnaire home and have the students return it the following day.

4. Have the students help tabulate the results of the questionnaire on a large sheet of paper.

DISCUSSION QUESTIONS:

1. Why did most of the parents move to this community? What reason was next?

2. Did we find that the community has become larger or smaller?

3. What were some things that happened because of the move?

4. What did we learn about the reasons some people choose to live in certain communities?

5. What things do you need from your community?

6. What things do you and your family give to the community?

SURVEY QUESTIONNAIRE

DEAR PARENTS,

WE ARE LEARNING ABOUT THE COMMUNITY AND ARE MAKING A SURVEY TO FIND OUT WHY PEOPLE CAME HERE TO LIVE. YOUR ANSWERS WILL HELP US IN OUR STUDY. PLEASE COMPLETE THE SURVEY AND HAVE YOUR CHILD RETURN IT TOMORROW. THANK YOU!

SINCERELY,

---

1. HOW LONG HAVE YOU LIVED IN THE COMMUNITY?
2. WHAT WERE YOUR REASONS FOR COMING TO THIS COMMUNITY?
   - A. JOB
   - B. GEOGRAPHIC AREA
   - C. BORN HERE
   - D. RECREATIONAL POSSIBILITIES
   - E. FAMILY TIES IN THE AREA
   - F. OTHER
3. HOW HAS THE COMMUNITY CHANGED?

   BIGGER FRIENDLIER/UNFRIENDLIER BUSIER

   NOISIER/QUIETER BETTER SCHOOLS/WORSE SCHOOLS

   MORE RECREATION/LESS RECREATION MORE CRIME/SAFER

   MORE SHOPPING/LESS SHOPPING OTHER
4. WHAT EFFECT HAS THIS HAD ON THE FOLLOWING?
   - A. HOMES
   - B. HIGHWAYS
   - C. WATER SUPPLY
   - D. THE AMOUNT OF POLLUTION

HOW TO TABULATE SURVEY DATA:

1. How long have most people lived in the community?

   1-5 years _____ 6-10 years _____ 11-15 years _____

2. What were the reasons for coming to this community?

   A. Job _____

   B. Geographic area _____

   C. Recreational possibilities _____

   D. Family ties in the area _____ Number of responses

   E. Born here _____

   F. Other _____

3. How has the community changed?

   Bigger _____

   Friendlier _____
   Unfriendlier_____

   Noisier _____
   Quieter _____

   Better schools _____
   Worse schools _____

   More recreation _____
   Less recreation _____

   More crime _____
   Safer _____

   More shopping _____
   Less shopping _____

   Busier _____

   Other _____

4. What effect has this had on the following:

   A. Homes (summarize)

   B. Highways "

   C. Water supply "

   D. Amount of pollution "

OPTION #2

MATERIALS AND RESOURCES

Masks or blindfolds

PROCEDURE:

1. Explain to the class that they are a population and they will be going outside to learn more about their environment.

2. Have the students each choose a partner. One of the partners is then blindfolded and the other student leads the blindfolded partner around the playground.

3. The blindfolded student is guided to these objects: tree, rock, fence and a flagpole.

4. The blindfolded student is to touch and squeeze each object and to describe what he feels.

5. Upon returning to the classroom, students are to share their experiences.

DISCUSSION QUESTIONS

1. How did each object feel?

2. When you squeezed the tree, do you think it felt your squeeze?

3. When you step on a plant, does it affect the leaf?

4. Has anyone ever stepped on your toes? How did that feel?

5. What happens when too many of us step on the same patch of grass?

6. What did you learn about your environment?

7. What ways do you affect your environment?

8. Did you feel the shade from the tree?

OPTION #3

MATERIALS AND RESOURCES:

Communities in Nature Murals (SVE)

PROCEDURE:

1. Using one or all four of the murals, place the organisms onto the mural in the area most suitable for the individual.

2. In each case ask for food, safety, or shelter needs before placing the organism on the mural.

3. After all the organisms are on the mural, ask the students to relate the organisms to each other.

   For example: predator - prey
   sharing
   helping
   part of a food chain

4. Have each student select an organism and draw it in its environment.

DISCUSSION QUESTIONS

1. How did we know where the organism belonged?

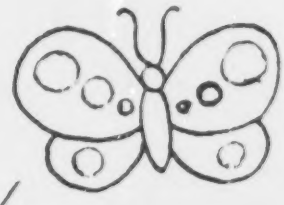
2. What are good ways to use to find where something belongs?

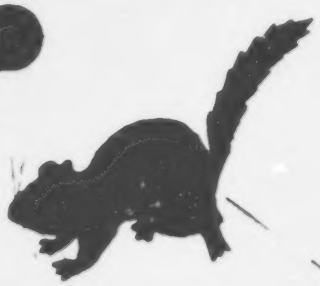
   For example: wings in the air
   fins in water
   hair on land
   legs on land/water/air

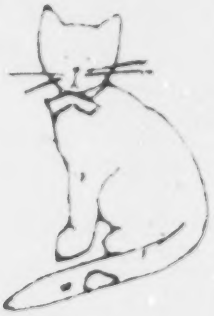
3. Does every organism share part of the environment? How do you know?

4. What do you share in your environment?

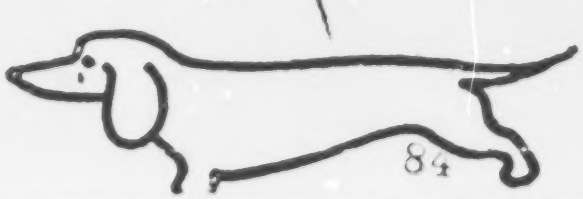
WHICH THINGS ARE ALIKE AND BELONG TO ONE TYPE OF POPULATION?







FELT CUT-OUTS COULD BE USED OR A SET OF 3x5 CARD PICTURES.



FURTHER ACTIVITIES

PICK-UP STICKS GAME: GIVE EACH GROUP OF FOUR STUDENTS A SET OF PICK-UP STICKS. EXPLAIN THE STICKS ARE LIKE INSECTS AND ANIMALS IN A COMMUNITY. THOSE OF ONE COLOR REPRESENT A POPULATION OF ORGANISMS. TELL THEM IT IS THEIR TASK TO REMOVE ALL OF THEIR COLOR FROM THE PILE. EACH STUDENT WILL HAVE HIS/HER OWN COLOR OF STICKS. YOU CAN VARY THE PLAYING SURFACE FROM HARD TO SOFT, WRINKLED, ROUGH, ETC. TO SEE HOW THE "ENVIRONMENT" AFFECTS THE STICKS.

5 GREEN STICKS	GRASS
5 RED STICKS	ANIMALS
5 YELLOW STICKS	SUN
5 BLUE STICKS	PEOPLE
5 ORANGE STICKS	FOOD

POPULATION 4

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to list examples of how populations are affected by natural and unnatural influences.

SUBJECT AREAS:

Science, Mathematics

KEY WORDS

Natural - Any influence that is not due to man's action as a result of his technology.

Unnatural - Any influence which goes beyond that expected of man due to normal abilities. Bulldozing is an unnatural influence. Tornadoes are a natural force.

OPTION #1

MATERIALS AND RESOURCES

4 empty milk containers, gallon size, or egg cartons

potting soil and dwarf zinnia or marigold seeds

Growth Chart ditto

The Organic Classroom, Rodale Press Educational Service Division, Emmaus, Pennsylvania, 1973.

PROCEDURE:

1. Cut milk containers down to three inches high or use egg cartons
2. Add two inches of soil to each.
3. Plant approximately the same number of seeds in each flat.
4. Start the plants in a warm, light place.
5. Plants should be kept moist at first.
6. Germination should occur in five to ten days. After germination allow all four containers to continue growing under the same conditions for about one week to insure hardier plants.
7. Place two containers in a dark corner of the room.

   A. One container will be watered daily.
   B. One container will not be watered.

8. Place two containers in a light area of the room.

   A. One container will be watered daily.
   B. One container will not be watered.

9. If light and dark areas are not available in the same room, two of the four containers could be covered and the other two left uncovered.
10. The plants which receive sunlight and water are the control group.
11. Observe and record the changes every three days.

    A. Note the number of leaves.
    B. Measure height of the plants.
    C. Continue recording for about three weeks.

12. Place a placard in the room with the following questions.

    Do plants need WATER? SOIL? SUN? The children can see at the end of the experiment if they were right.

OPTION #1 con't

DISCUSSION QUESTIONS

1. What do plants need to live?
2. Which flat has the best looking plants?
3. Is there any group where most of the plants have died?
4. What caused the plants to die?
5. Is there any group that does not look green or looks different?
6. What caused the change in color?
7. Are there any other changes that you noticed?

PLANTER #_____

GROWTH CHART

	CONTROL GROUP			EXPERIMENTAL GROUP		
	HGT	NUMBER OF LEAVES	COLOR	HGT.	NUMBER OF LEAVES	COLOR
DAY 1						
DAY 3						
DAY 5						
DAY 7						
DAY 9						
DAY 11						
DAY 13						
DAY 15						
DAY 17						
DAY 19						
DAY 21						

OPTION #2

MATERIALS AND RESOURCES

8 wooden or metal stakes

24-30' of string to set off the area to be studied

4 square feet of burlap or other cloth to filter out the light

watering can

hammer

Suggested books for this option are listed below:

In Yards and Gardens, Margaret W. Buck
The Tall Grass Zoo, Winifred and Cecil Lubell
All About the Insect World, Ferdinand C. Lane
The Time Book of Insects, Illa Podendorf
The How and Why Wonder Book of Insects

PROCEDURE:

1. Before beginning the experiment, discuss with the children the things they feel affect the number of plants and animals that live in a certain area. Discuss questions 1-5.

2. After the discussion tell the class they are going to study the plants and animals that live in a small area of the school grounds. We will do something to certain areas and watch for changes.

3. Armed with stakes, string, hammer and watering can, take the children out to an area of the school grounds that will not be in the way of play or traffic.

   A. Stake off three sections, each a four foot square. (2'x2')

   B. Give the students ten minutes to find as many organisms as they can in each section.

   C. Tie string around the stakes.

   D. Cover one area with burlap, staked down or tied down at various points.

   E. Do nothing to the third area.

   F. Water the second area daily even after a rainfall.

   G. With the help and assistance of a friendly custodian, these areas should be left uncut for at least the first two weeks of the experiment.

4. Encourage the children to check for changes in the areas daily. After watering watch for any change in insect life that may be present.

5. After two to three weeks remove burlap and study how the three areas differ in plant and animal life.

OPTION #2 con't

DISCUSSION QUESTIONS

1. What is needed for many green plants to grow in an area?
2. When it rains, is it always good for green plants?
3. How does rain affect insects?
4. Why do we see a lot of worms on the ground after it rains?
5. If we water an area will the same thing happen?
6. Which of the three sections has the most green plants?
7. Which area looks best to you? Why?
8. What did the burlap do? Did it affect the plant growth?
9. Does any section have more insects than others? What about worms?
10. How did the plant and animal life do under nature's own care, without our doing anything more?
11. If we left all plants to be cared for by nature, will they all survive? Why? Can that hurt us? How?
12. What can we do if it does not rain?
13. What will an insect do if he has no food source?
14. What if the weather is not favorable to the insect?
15. Do you know of any insects that move when the weather changes?

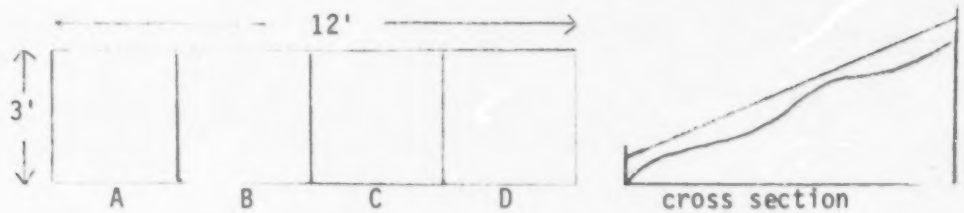
OPTION #3 - best done in the spring

MATERIALS AND RESOURCES

Ten stakes

32' of string

A hilly area covered with leaves, divided into four sections



PROCEDURE:

1. Uncover the leaves from one section of the hill.
2. Uncover the leaves from another section of the hill and make ruts.
3. Leave another section of the hill alone.
4. Contour "plow" the fourth area.
5. Leave the entire area to natural forces for about one month.
6. Have the students observe the hill at least once each week and record their observations.
7. If nothing occurs in this period of time, continue your observations.

DISCUSSION QUESTIONS

1. Which section of ground changed?
2. What caused these changes?
3. How did we cause some of these things to change?
4. Were the things we did natural or unnatural changes?
5. What natural things happened to cause these changes?
6. Where can we see examples of section D?
7. Does man have good or bad affects on his environment?

POPULATION 5

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to list examples of how populations have located where their needs are most likely to be satisfied.

SUBJECT AREAS:

Science, Social Studies

OPTION #1

MATERIALS AND RESOURCES

Three one gallon clear glass jars and lids
Black paper
Three quart size clear glass jars
Three sponges
Loose or sandy soil
Bird or grass seed
Plastic straws, the flexible type

What is a Community?, #95 film coop filmstrip

Insects as Pets, pages 43-56

Collecting for the City Naturalist, pages 50-52

Pets in a Jar, pages 58-63

PROCEDURE:

Making two ant jars - We must be able to see what the ants are doing underground. Put the smaller jar upside down in the center of the larger jar. The space between the two jars should be filled with loose or sandy soil. The space should be completely filled but avoid packing down the soil too tightly or the ants will have a hard time digging.

Jar 1 - Find an anthill. Dig down into the area around the hill. Remove 20 or so ants and the queen if possible. If you don't get the queen the ants will still live for awhile. It is very important that all the ants come from the same anthill. Put these ants into the prepared ant jar and place a damp sponge on top of the soil. Screw on the lid to keep them from escaping. Don't worry about the ants getting enough air. When you remove the lid for feeding purposes, air will enter. The fewer ants, the more activity.

Jar 2 - Find ants from two different colonies but no queen and place them in the second jar. Cap the jar.

Wrap both jars with black paper to keep out light. In about a day the ants will begin building tunnels and rooms. Once a week feed the ants a few drops of sugar water and a few grains of bird or grass seed, placing it directly on the soil. Do not overfeed. Keep the sponge moist. Keep the Ant Jars at room temperature away from heat and air conditioning.

If you do not disturb the Ant Jars, the ants will build a complete underground ant city. After they have built their cities prepare a jar with everything but ants and connect it to one of the jars with flex straws. Observe what happens.

DISCUSSION QUESTIONS:

1. Has anyone ever seen an ant carrying something? How does he carry it?

2. Did you know there are queen ants, soldier ants, and worker ants? Which are which? Can you tell?

OPTION #1 con't

3. What was the first thing the worker ants did in our ant jars?
4. Are there differences in the way ants in both jars got along?
5. How do ants help us?
6. Could these ants live in a block of wood?
7. What do ants need?

OPTION #2 - spring of the year

MATERIALS AND RESOURCES

Wide-mouthed jar, quart size

Soil and sand

Earthworms

Black construction paper

Pets in a Jar, pages 53-57

PROCEDURE:

1. Place damp soil in the jar to within two inches of the top.
2. Cover with a thin layer of sand.
3. Add the earthworms.
4. Cover the jar with a piece of black paper making a shield to shut out the light. Leave undisturbed for several hours.
5. Have the students observe the jar daily but place the paper over the jar when they are finished.

DISCUSSION QUESTIONS

1. Where did we put the earthworms? Where have they gone?
2. What did you see on the top of the sand? (castings)
3. What did the earthworms do to the dirt?
4. Earth passes through the worms body supplying food and emerging as castings. How do you think the earthworm helps the garden?
5. How do you think the channels or tunnels help the ground?
6. What changes were observed daily?

OPTION #3

MATERIALS AND RESOURCES

String or tape to divide the room

Slips of paper designating which area the student is assigned to

Filmstrips - SVE Sights and Sounds Series: City, Farm, Neighborhood

PROCEDURE:

1. Divide the room into three areas: city, lakes or subdivision area and farm area. Distribute folded slips of paper with a number on each one designating which area each student will occupy. (See chart on p. 31.)

   A. Most of the children will be in Group 1, the apartments or the city. They should be away from the windows in the darkest corner of the room near the games. These people live close to all conveniences but they do not have any access to open spaces. Children must be quiet, whispering only and must stay in their seats. No more than one can go to the store at a given time. Rules are very important to people who live in the city.

   B. Group 2 is the lake or subdivision area, not as crowded as Group 1. Two or more may work or play together. They are farther from the drinking fountain, washroom, books, and materials.

   C. Group 3 is the farm area, the largest and farthest away from everything. They are allowed to do everything they wish. Mostly activity games are here. These people should be close to the windows. People are happy here.

2. The first time this activity is introduced the children are assigned a place to live. The second time the children may negotiate or bargain for their place to live.

3. After this activity is played a second time, the children should have a better understanding of the advantages or differences of the different areas.

DISCUSSION QUESTIONS:

1. Why did you choose to live here?

2. Does the place you chose have everything you want?

3. Why aren't all areas the same size?

4. Are there the same number of each area? If not, why not?

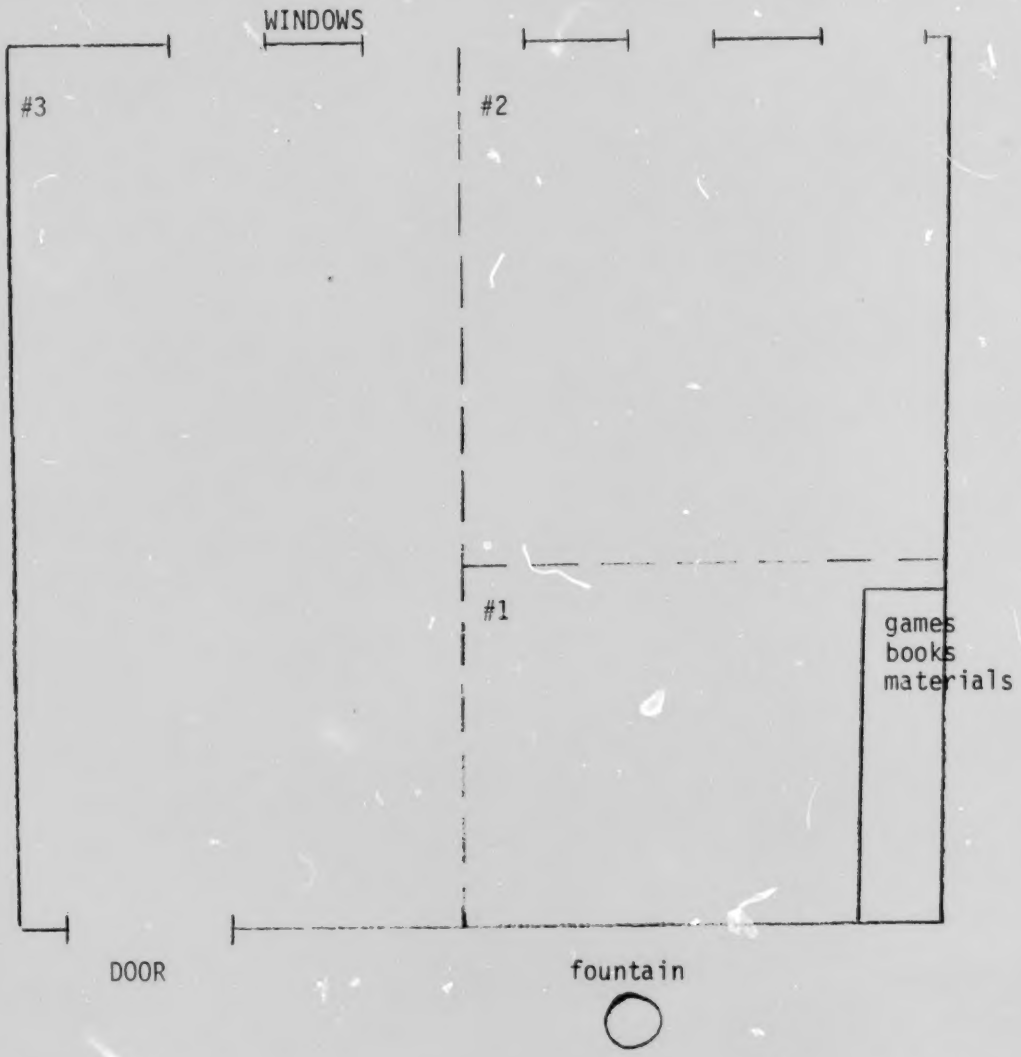
5. Where would we put more people in your neighborhood? Why?

6. Why do you live where you do? Why don't you live in New York or Florida?

FURTHER ACTIVITIES:

1. Have the students draw a picture of the environment they would like to live in.

2. The World Book describes the earthworm and its activities. Have the child ask his parents to look up something about the earthworm and tell us about it the next day.



ENVIRONMENTAL ETHICS

ENVIRONMENTAL EDUCATION

VALUES FOR THE FUTURE

ANTIOCH COMMUNITY SCHOOL DISTRICT 34
TITLE IVC ESEA 93

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Synopsis

Ethics 1: At the completion of this unit the student will be able to explain why people all over the world have similar basic needs.

Option 1 - Children use various media (story, filmstrips) to introduce them to the Pilgrim's lifestyle; the unit culminates with the preparation of Pilgrim's food. ... 3
Option 2 - The children construct Pilgrim housing to identify with man's need for shelter. ... 8
Option 3 - The children construct Indian teepees to identify with man's need for shelter. ... 9

Ethics 2: At the completion of this unit the children will be able to identify contributions and benefits individuals make and receive in society.

Option 1 - The children use charted classroom duties to identify responsibility. ... 15
Option 2 - The children use co-operative squares to establish the benefits of working together. ... 17
Option 3 - The children interact cooperatively to see how they can benefit from others in society. ... 19

Ethics 3: At the completion of this unit the children will be able to explain that people have different value systems based on lifestyles.

Option 1 - The children see the clothing worn in different climates and compare it to their own. ... 21
Option 2 - The children use and prepare menus. ... 22
Option 3 - Through the use of categorizing the children define different values for objects with similar characteristics, in this case, books. ... 26

Ethics 4: At the completion of this unit the children will see through the study of snowflakes that there is much about the environment which we do not understand.

Option 1 - The children observe and compare snowflakes to find that all are different. In the alternative option the children observe and compare leaves. ... 28
Option 2 - The children use prepared slides of snowflakes to observe and compare. ... 30
Option 3 - The children use different forms of water to discover similarities and differences. ... 32

EXPLANATION OF CONCEPT AREA

ETHICS - The goal of any environmental education program should be to assist students in the development of a system of values consistent with our role as stewards of our environment.

To this end we begin with the development of a basic idea of individual needs and the need for sharing. From this we then explore the wonders of our environment.

We then build the concept of stewardship based upon our personal lifestyle and attitudes.

In grades 6-8 we present the idea of man's role in helping to preserve the natural order and the importance of a pleasant environment for now and the future.

In high school the idea of a personal value system is developed and tested for its applicability to our own society and the world environment.

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to explain why people all over the world have similar basic needs.

SUBJECT AREAS:

Art, Social Studies, Science, Home Economics

OPTION #1 - Thanksgiving time

MATERIALS AND RESOURCES

Pictures depicting Thanksgiving story
White and colored construction paper
Scotch tape or stapler
Plymouth story
Cranberries, sugar, measuring cup, small bowl, mixing spoon, pot
Three pints of whipping cream, small jar with lid, knife, crackers
Let's Find Out About Thanksgiving
Filmstrip: Mary's Pilgrim Thanksgiving

PROCEDURE:

1. Begin the unit by reading the story about Pilgrims.

2. Discuss who the Pilgrims were and their reason for journeying to this country.

3. Discuss their trials and troubles the first winter.

4. Finish the unit by churning butter and making cranberry sauce.

5. Have the students dress in their collars and headbands while eating the food. Ask them if they want to be Indians or Pilgrims.

DISCUSSION QUESTIONS

1. What things happened on the trip to the new world that caused trouble for the Pilgrims?

2. What kind of land did the Pilgrims see when they landed?

3. What things did they have to find or obtain from their new setting?

4. Who helped the Pilgrims find these things?

5. Why did the Pilgrims grow what they grew?

6. What needs did the Pilgrims take care of first?

7. What would you do if you landed in this area and had no food, clothing, shelter, etc.?

INDIAN HEADBANK INSTRUCTIONS:

Using large size construction paper, cut 2" strips to fit the student's head. Cut a feather out and attach to the headband with tape or staples.

PILGRIM COLLAR INSTRUCTIONS:

Trace the enclosed pattern for pilgrim collar. Make the neck size larger or smaller to fit each individual child.

BUTTERCHURNING:

Take a ½ pint of whipping cream and put half of it in a jar with a lid. Shake and shake and shake. Soon the butter will separate. Continue to shake and shake. When the butter seems firm take out. Put on bread, crackers, etc.

CRANBERRY RECIPE:

1 package of cranberries (one pound)
1 cup of water
2 cups of sugar

Heat all the mixed ingredients until the berries pop. Quiet the students so they can hear the berries popping. Serve on individual crackers.

JOURNEY CAKE (cornbread):

1 cup of cornmeal
½ cup of white flour
2 tsp. baking powder
1 tsp. salt
1 egg
1/3 cup sugar
½ cup milk
2 tbsp. melted butter

Mix corn meal, flour, baking powder and salt. Mix sugar and butter. Beat the egg. Put everything together and stir in the milk. Pour mixture into a greased pan and bake at 360° for twenty minutes. The recipe makes enough for about thirty students to have a sample.

COLLAR PATTERN
CUT ON SOLID LINES. ENLARGE
NECK OPENING IF NECESSARY.

5

PLYMOUTH

Long ago there were a group of people called Pilgrims. These people were not liked and had many problems in England and asked the king if they could leave his country. They gave money to a ship owner to bring them to America where they could live in peace.

These people spent many long and hard months sailing on a ship named the Mayflower before they reached Plymouth on the coast of America.

The first problem the Pilgrims had was housing. Sometimes holes were dug into the hillside and walls were made of grass and dirt or trees. Later these people put up small houses made of wood.

They were poor people who could hardly read. Most of them were carpenters, blacksmiths, or shoemakers. They were not good at hunting; most of them had never fired a gun or a bow and arrow. They had counted on fishing and there were plenty of fish but the hooks they had were all too big to catch fish. The first year food became scarce and fifty of the Pilgrims died.

These Pilgrims wore suits and dresses made of material colored from plants, the colors of which were brown, tan, and rusty red. They also wore shoes tied with laces, knitted woolen socks, pants made from leather, hair to their shoulders, and a soft cap or a wide-brimmed hat.

Women wore a close-fitting cap under their hoods. Each woman wore an apron.

Two Indians, Samoset and Squanto, became friends of the Pilgrims. Samoset taught the Pilgrims to plant corn and also showed them how

to bury a fish in each hole along with the seed for fertilizer. Squash and beans were planted between the rows of corn and grew up the cornstalks. Without this help from the Indians all the Pilgrims would have certainly died.

To celebrate the harvest the famous first Thanksgiving dinner was held. The people celebrated for three days. Wild turkeys and deer were obtained for the feast.

The Pilgrims were especially grateful to Samoset for showing them how to find clams. With clams and their small harvest they were able to barely survive until the next spring.

OPTION #2 - Thanksgiving time

MATERIALS AND RESOURCES

The Pilgrim's Party, by Jean George
1620 Year of the Mayflower
Filmstrips: Pocohontas, Friend of Any Settler
The First Thanksgiving
Lincoln logs
Wooden coffee stirrers
Posterboard for base of villages

PROCEDURE:

1. Read both stories and show the filmstrips. Discuss the lifestyle of the Pilgrims.

2. Have the students construct a cabin from the Lincoln logs or an Indian village from the coffee stirrers.

3. Children may wish to add their own ideas for grass, maybe some stones, etc.

DISCUSSION QUESTIONS

1. What things did the Pilgrims need to live here?

2. Where did they find these things?

3. Did anyone help the Pilgrims?

4. Why did the Pilgrims decide to stay here?

5. What things do you own that the Pilgrims did not have?

6. Have your parents or grandparents moved to satisfy a need, i.e. better schools, new job, new home, etc.?

FURTHER ACTIVITIES

1. Set the background for role playing by explaining they are landing in a new place, historic or present.

2. Have the students work through the things they would have to have in this new setting - water, food, shelter, etc.

3. List these on the blackboard and divide the class into two groups. Each group must make their own plan to meet their needs.

DISCUSSION QUESTIONS

1. What things did we have to find or obtain from our new setting?

2. What things might be the same regardless of the setting?

3. What can we call these? (Work toward the term "basic needs".)

4. Which basic needs would be the same for <u>every</u> group of people that landed in this setting?

OPTION #3 - Thanksgiving time

MATERIALS AND RESOURCES

Teepee materials: brads, nails, three two by twos eight feet long, an old sheet, heavy cord
Children's potholder loom, yarn
Construction paper, scissors, stapler
Clay
Masking tape
Muslin material, thread, needles, small buttons, felt

PROCEDURE:

1. Have the students read about the Indians.

2. Have them review the Pilgrims story.

3. Construct the teepee by lashing the two by twos into a pyramid shape with heavy cord. See Diagram 1.

4. Have the students make pottery, toys, and weave small rugs for a dollhouse. Pilgrim and Indian children had only handmade toys and the turtle (pattern included) is a sample of such. Headbands can also be made.

DISCUSSION QUESTIONS

1. What things did the Indians do?

2. Why did they do these things?

3. Was their life different from yours?

4. What needs did they have?

5. How did the Indians help the Pilgrims meet their needs?

FURTHER ACTIVITIES

1. Prepare a Thanksgiving dinner at school.

2. Have students make placecards. Cut the portion out so that the hats will stand up.

3. Make Thanksgiving bouquets from dried weeds using thistle, teasle, goldenrod, cattails, pine cones, and grasses.

4. Acorn Cakes:

   Gather about four cups of acorns. Place them on a cookie sheet and dry for about twenty minutes in a 350° oven. Split with a nutcracker and grind into a fine meal. Mix two cups of this meal with a ½ teaspoon of salt and 3/4 cup of water to form a stiff batter. Let stand at room temperature for about one hour. Fry in three tablespoons of cooking oil.

9

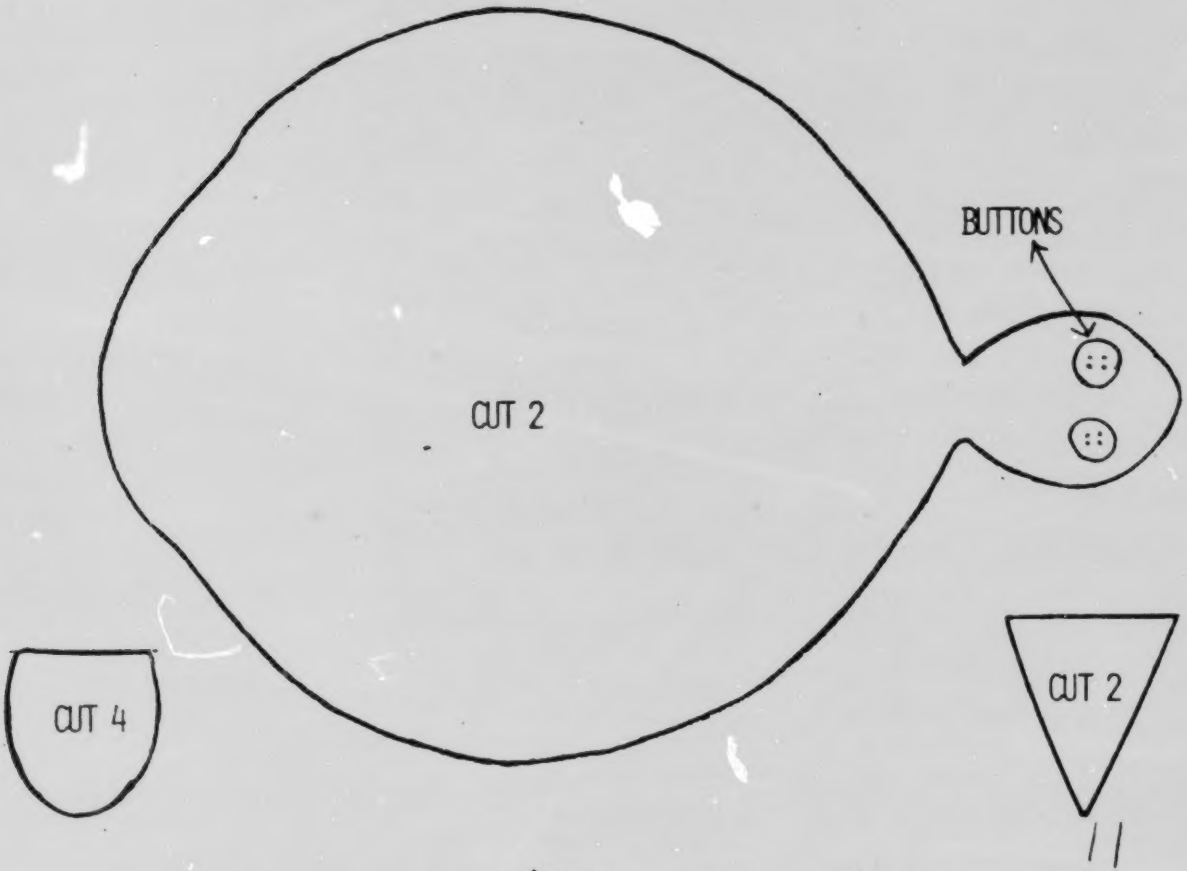
DIAGRAM 1

TEEPEE

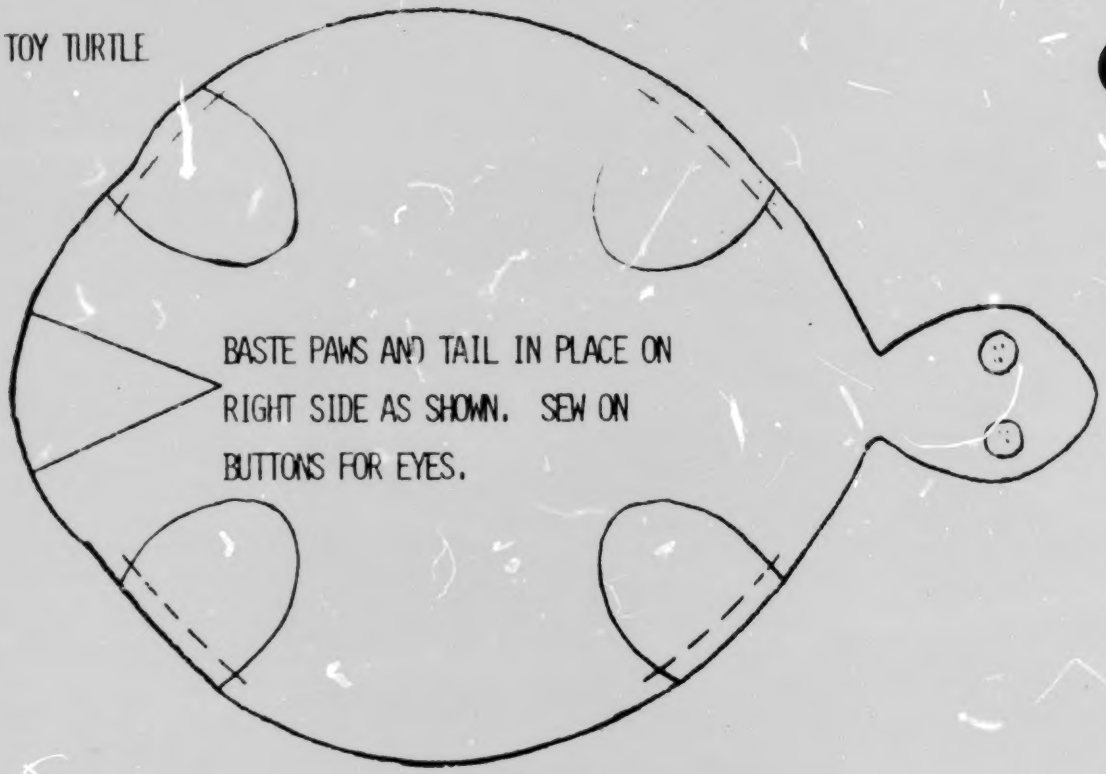
TOY TURTLE

Toy Turtle can be made in almost no time at all. Its body is just two pieces of percale. The top is printed and the underside a solid color. Its eyes, paws and tail are of dark-colored felt.

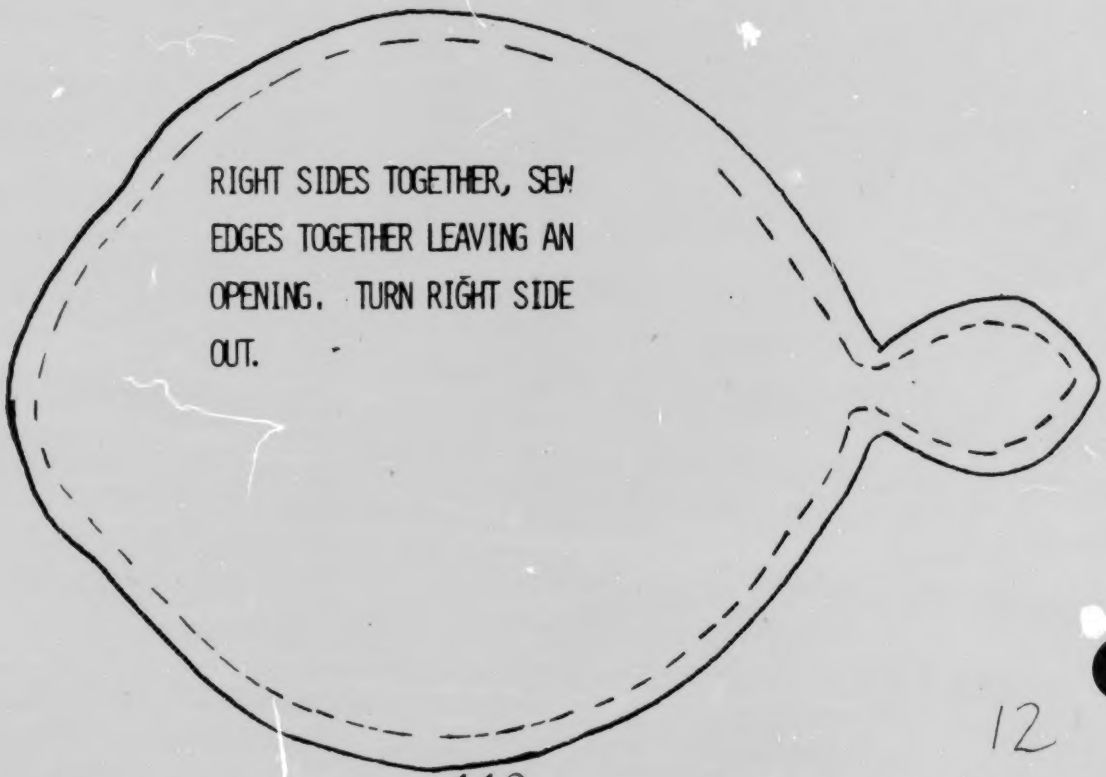
1. Make your patterns. Mark the spots for the eyes and the notches for the paws and tail. Pin the patterns to the cloth and felt and cut them out.
2. Sew the eyes to the head. Baste the paws and tail to the top piece at the notches. (A)
3. Pin the two body pieces together, right sides on the inside. Sew the edges together leaving an opening at the side. Turn the work over and stitch the seam a second time. (B)
4. Snip the edges at X marks. Turn the work right side out and fill with beans. Fill the bag about two thirds full. Blind stitch the opening closed.



TOY TURTLE



BASTE PAWS AND TAIL IN PLACE ON RIGHT SIDE AS SHOWN. SEW ON BUTTONS FOR EYES.

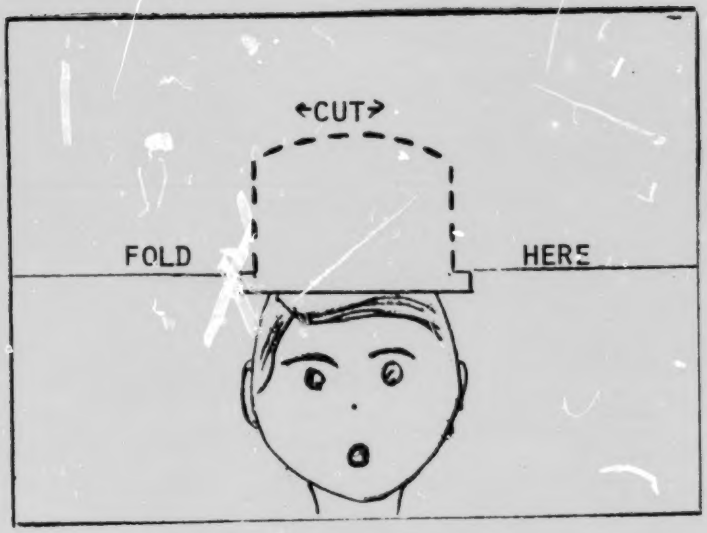


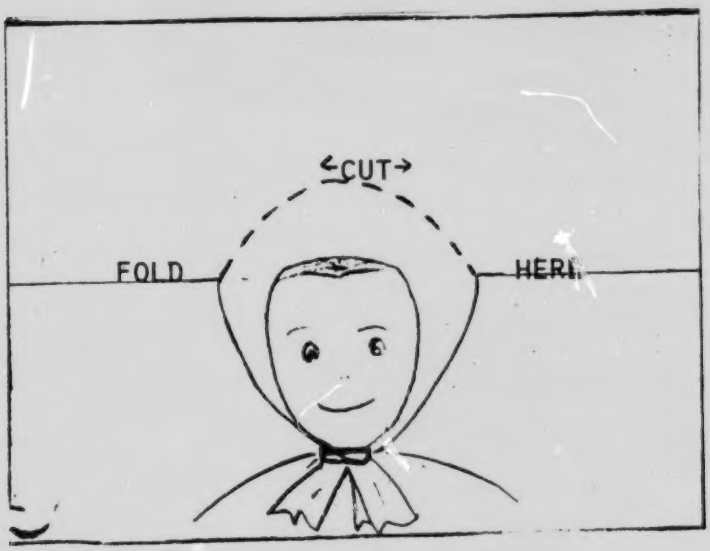
RIGHT SIDES TOGETHER, SEW EDGES TOGETHER LEAVING AN OPENING. TURN RIGHT SIDE OUT.

12

OPTION #3

PLACECARDS





13

ETHICS 2

BEHAVIORAL OBJECTIVE:

At the completion of this unit the children will be able to identify contributions and benefits individuals make and receive in society.

SUBJECT AREAS:

Social Studies, Mathematics, Art, Language Arts

OPTION #1

MATERIALS AND RESOURCES

Chart with classroom duties checklist
Name tag for each child
Pictures reflecting responsibility or duties

PROCEDURE:

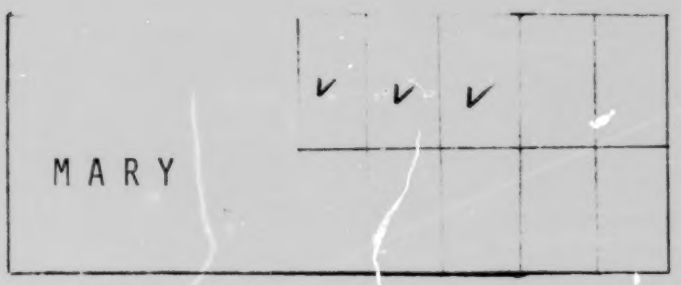
1. Prepare a chart with classroom duties, i.e. erase boards, pass out papers, etc. NOTE: For kindergarten and first grade, pictures may be used to depict duties. Title the chart RESPONSIBILITIES.

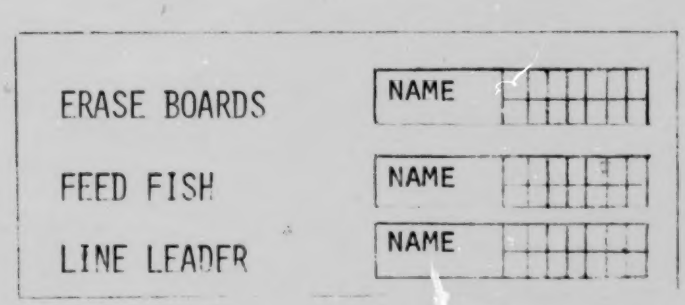
2. Place a student's name tag next to each duty.

3. The teacher will explain the chart to the class, stressing the word RESPONSIBILITY.

4. Each child will place a check on his name tag at the end of the day if he has fulfilled his responsibility.

5. Depending on the number of duties and children, the tags must be changed about every three days.





6. After each child has assumed some responsibility indicated on the chart, open a discussion on RESPONSIBILITY.

7. Prepare a bulletin board area for the children to bring pictures indicating responsibility outside the classroom.

8. To this bulletin board add a list of the things the children are required to do at home. (This should be a result of the discussion in question 6.)

OPTION #1 con't

DISCUSSION QUESTIONS

1. Ask students, "What does RESPONSIBILITY mean to you?"

2. Do you feel that people in the class should act in ways that make living more pleasant for others?

3. In what ways do you show responsibility?

4. How important do you think it is to develop and keep a sense of responsibility?

5. Can you think of ways that you can show responsibility in your daily living? NOTE: Here it is possible to have the students express their answers in the form of a group mural. The use of visual interpretation might enhance concept development at this point.

6. If you plan to make any changes in the way you act toward others, please say what changes you will make.

7. If you plan not to make any changes in the way you act toward others, please state why not.

OPTION #2

MATERIALS AND RESOURCES

1 set of cooperative squares for each group of five children (pattern included)
Tables or floor space to work with the squares in full view of each other

PROCEDURE:

1. Arrange a group of five children around a work area.

2. Shuffle the pieces of the squares.

3. Tell the students:

   a. Each of them will get different kinds of pieces and must construct a square. Each square must be the same size.
   b. They are not permitted to speak.
   c. They may not take pieces from anyone else.
   d. They may give away any pieces to someone else.

4. Pass out the pieces with the same label; the label does not mean a match.

5. Have the children begin; they will soon discover that each of them is forced to form the same shape once they begin giving away pieces.

DISCUSSION QUESTIONS

1. Was anyone able to form a square with the pieces I gave you?

2. What did you have to do in order to complete the task?

3. How were you able to complete your shape?

4. How were others able to complete theirs?

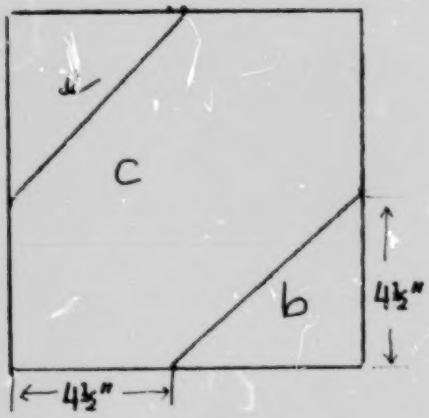
5. Could three squares be formed in a group if one person did not cooperate?

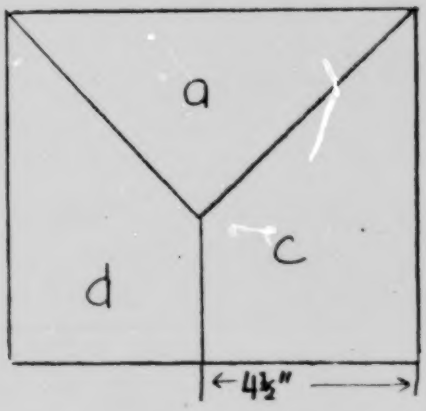
6. What does this tell us about cooperation?

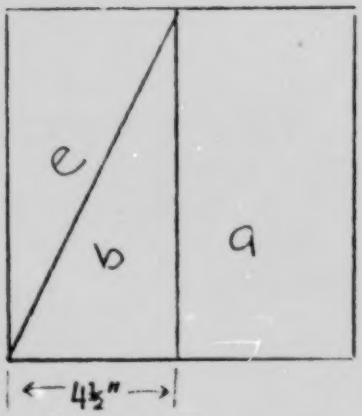
7. Does the amount of time it takes all five group members to cooperate determine how long it took your group to complete the task?

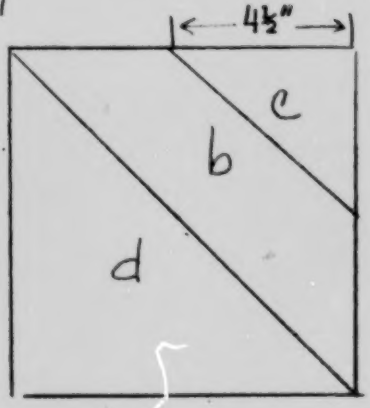
NOTE: The teacher may wish to bring out the amount of time and effort seemingly wasted in holding back from a group working cooperatively.

COOPERATIVE SQUARES PATTERN









OPTION #3 - two weeks time

MATERIALS AND RESOURCES

Construction paper
Scissors
Glue
Straight pins
Masking tape
Markers
Cotton
Slides and tape, available through E^2 Office

PROCEDURE:

1. Present the story "The Warm Fuzzies".
2. Conduct a discussion on student feelings about "Fuzzies" and the desirability of experimenting with interaction.
3. Each student constructs a "Fuzzy" of his own in the shape of an envelope and fills it with cotton.
4. Pin the completed "Fuzzy" holder on each child making sure it is readily accessible to him.
5. Each student will hand out a "Fuzzy" while extending a friendly greeting to another.
6. Bring the class together for a debriefing before discussion questions.

DISCUSSION QUESTIONS

1. Why should we be nice to people?
2. Should we be nice to people?
3. How do you feel when someone is nice to you?
4. Can you give examples of this?
5. How do you feel when someone is unkind to you?
6. Do you think everyone should be nice to everyone else?
7. Do you think it is important to think of other people's feelings?
8. Do you believe that if you are nice to someone, that person will be nice to you?
9. What would the world be like if no one was nice to one another or if everyone thought only of themselves?

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to explain that people have different value systems.

SUBJECT AREAS:

Social Studies, Health

OPTION #1

MATERIALS AND RESOURCES

Posterboard, scissors, paste or glue
Clothing catalogs such as Sears, Wards, Penneys, etc
Man: A Cross-cultural Approach, filmstrip available from E^2 Office
Allyn-Bacon Social Studies Text, 2nd grade, Eskimos, Aborigines

PROCEDURE:

1. Divide the class into three groups.

   a. Group A will be sent to live in a very hot climate.
   b. Group B will continue to live here.
   c. Group C will move to Alaska.

2. Have each group cut out pictures of the type of clothing a boy and a girl would need to be comfortable in the climate they would live in.

3. Have each group paste these pictures on a posterboard.

4. Each group is to display their poster and explain the reasons they chose the clothing.

DISCUSSION QUESTIONS

1. What differences in clothing were found on the boards?

2. Why did you choose the clothing?

3. Could people in Alaska wear the same types of clothing chosen for people in the hot climate? Why or why not?

OPTION #2

MATERIALS AND RESOURCES

Menu list, one for each group
MacDonald's Nutrition Pack, available from MacDonald's Corporation

PROCEDURE:

1. Divide the room into groups of four students each.

2. Each group is to select a menu for one day from the menu list.

DISCUSSION QUESTIONS

1. Why do you like some foods and not others?

2. Why did you choose the foods you did?

3. Are these choices the best to eat? Why or why not?

4. Were your choices similar to other group choices?

5. Why did they choose what they did?

FURTHER ACTIVITIES

1. Have the students check menus found in newspapers and compare these to their own.

2. If the school prints a menu, have the students check which basic groups these foods belong to.

3. Use the menu plan from MacDonald's Nutrition Pack.

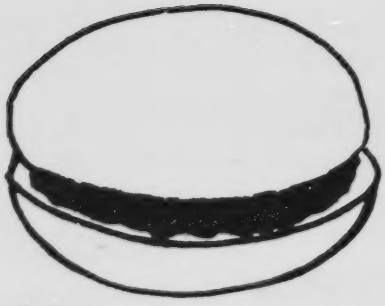
☐ Send me ____ McDonald's Nutrition Pack(s) at $1.00 each
☐ Send me ____ McDonald's Ecology Pack(s) at $1.00 each

Enclosed is $_____ for postage and handling to partially cover production. Check or money order only, please, payable to McDonald's Action Packs.

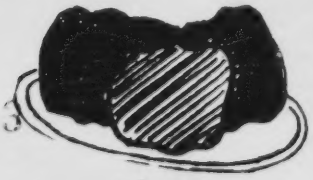
MAIL TO:
McDonald's Action Packs
Box 2594
Chicago, Illinois 60690

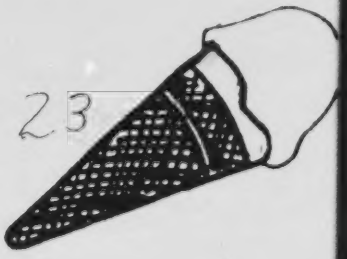
NAME _____
(please print)
ADDRESS _____
CITY _____
STATE _____ ZIP _____

menu

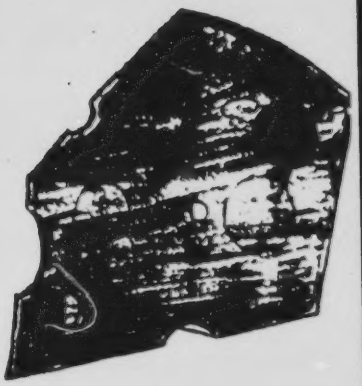


baked apples	Fiddle Faddle
oranges	taffy apples
grapefruit	bubble gum
bananas	ham sandwich
jello	tuna salad sandwich
ice cream	chicken sandwich
milk	bean soup
orange juice	vegetable soup
eggs	waffles
sugar coated cereal	doughnuts
cookies	fish
lemonade	French fries
candy	pork chops
baked potato	chicken
mashed potato	meat loaf
noodles	turkey
sweet potatoes	bacon
bread	hot dogs
chocolate cake	hamburgers
asparagus	cole slaw
beets	ham



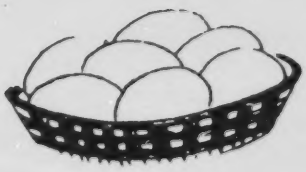


list



carrots
spinach
green beans
baked beans
tomatoes
apple pie
applesauce
Fritos
rice
pancakes
grilled cheese
coffee cake
popcorn
pudding
tamales
onion rings

spaghetti
meatballs
beef stew
muffins
soda pop
biscuits
potato chips
pizza
macaroni and cheese
pork sausage
tossed salad
oatmeal
peanut butter and jelly sandwich
tacos
Pop-tarts
chop suey



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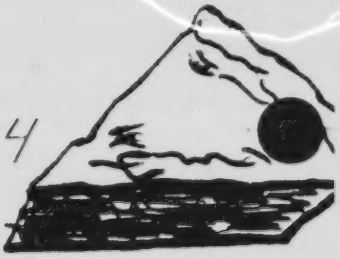


MY MENU

BREAKFAST:

LUNCH:

DINNER:

OPTION #3

MATERIALS AND RESOURCES

Library books

PROCEDURE:

1. Have each student find a book in the library on any subject they wish.

2. When students return to the room have them put these books in categories. You might have to suggest the categories but call these groups.

DISCUSSION QUESTIONS

1. Were all the books put into the same group?

2. How many different groups were there?

3. Did we differ on the placement of these books in the different groups?

FURTHER ACTIVITIES - Pose a problem situation to the class.

1. Ask the students to imagine that Mr. Meany bought all the television stations and then turned off all the programs or

2. Begin discussion talking about walking on sidewalks, crossing lawns, etc. A little boy named Joe walked across Mrs. Brown's lawn. He saw an apple tree with nice red apples hanging low. Joe was hungry and he wanted one so he ripped it off the tree. "It was just one. Mrs. Brown won't know I took it." Did it belong to Joe?

DISCUSSION QUESTIONS

1. Did this man have the right to do what he did? Why or why not?

2. Who would have the right to do something like this?

3. What can we do about the situation?

4. How could we have stopped the situation before it began?

ETHICS 4

BEHAVIORAL OBJECTIVE:

At the completion of this unit the children will see through the study of snowflakes that there is much about the environment which we do not understand.

SUBJECT AREAS:

Art, Science, Mathematics, Social Studies

OPTION #1 - Wintertime when snow is on the ground

MATERIALS AND RESOURCES

Hand microscope
Black paper
Spectroscope
Magnifying glasses or hand lenses
White or black paper
White or pastel chalk

PROCEDURE:

1. Dress the children for outdoor work.
2. Take them on a snow walk and observe the school area.
3. Collect snowflakes on black paper and examine them with hand lenses.
4. Make drawings of snowflakes.

DISCUSSION QUESTIONS

1. Are snowflakes different sizes?
2. Are snowflakes different shapes?
3. Can you find snowflakes with different patterns?
4. Are any snowflakes broken? What might break them?
5. What happens when you touch them with bare hands? Why?

OPTION #1 ALTERNATIVE - Fall of the year

MATERIALS AND RESOURCES

Hand magnifying glasses
Leaves

PROCEDURE:

1. Take the children on a walk in a nature area or the schoolyard.
2. Have each of them pick up a leaf.
3. Arrange the children in a circle on the grass and have them examine their own leaf and decide how it is different.
4. Let them use the hand magnifying glass.

OPTION #1 con't

DISCUSSION QUESTIONS

1. Are all leaves alike?
2. Are they all shaped the same?
3. What makes your leaf different?
4. What breaks your leaf?
5. How is your leaf different from your neighbors? Exchange it with the person next to you.

FURTHER ACTIVITIES

Place your leaf into a box or on paper with all the other leaves. Now see if you can find yours.

OPTION #2

MATERIALS AND RESOURCES

Prepared snowflake slides, available E^2 Office

PROCEDURE:

Take prepared snowflake slides and project them on a screen so that all students can observe them.

DISCUSSION QUESTIONS

1. Are snowflakes different sizes?

2. Are snowflakes different shapes?

3. Can you find snowflakes with different patterns?

4. Are any snowflakes broken? What might break them?

5. What happens when you touch them with bare hands? Why?

FURTHER ACTIVITIES

Study tracks of animals in the snow. Have the students measure how long each track is and determine which way the animal was going. Try to determine what type of animal made the track.

Use one tablespoon of Epson Salts to 1/8 cup of warm water. Spread this mixture on a piece of glass. Crystals will form.

Play "Dance of the Sugar Plum Fairies". Have the students pretend to be snowflakes dancing through the air.

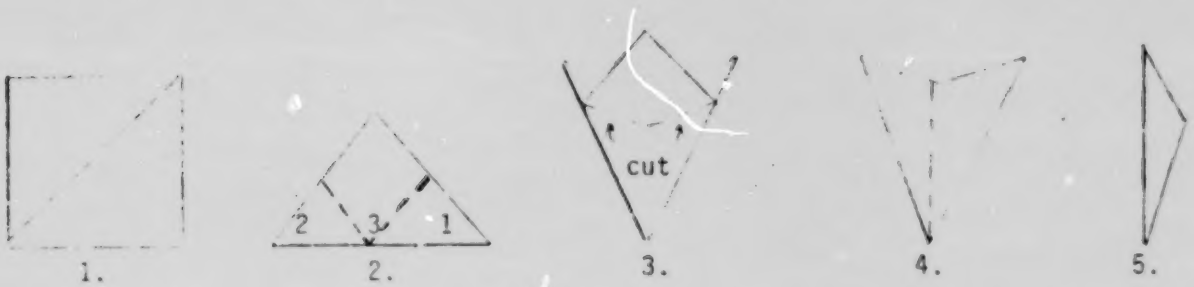
OPTION #2
FURTHER ACTIVITIES con't

MATERIALS AND RESOURCES

White paper
Scissors
Snowflake pattern

PROCEDURE:

1. Using a square sheet of paper, fold across diagonally.
2. Next fold section 1 over section 3. Fold section 2 over section 3.
3. Your paper should look like this. Cut through all thicknesses on the last dotted line.
4. You now have a six-sided uncut snowflake. Make one more fold.
5. Holding the narrowest point of your folded paper, cut any design you wish. When you are finished cutting, open very carefully.



MATERIALS AND RESOURCES

Wide-mouthed jar (a mayonnaise jar works well)
Masking tape

PROCEDURE:

1. To make a snow gauge, place a piece of masking tape on the outside of the jar. Mark this tape in ½ inches beginning at the bottom.
2. Place the gauge outside away from the building and record data each hour during a heavy snowfall.
3. Record the data on a graph.
4. Record clouds, wind direction, air temperature, and snow temperature daily for two weeks. Chart all data and make a graph of your findings.

OPTION #3

MATERIALS AND RESOURCES

Scale
Ice cubes
Snow
Tray

PROCEDURE:

1. Place an ice cube and a snowball, both weighing the same, on a tray.

2. Time to see which melts faster.

DISCUSSION QUESTIONS

1. Which melted faster?

2. Why do you think one melted faster than the other?

3. Why can the snow be packed into a ball?

4. Have you ever built a snowhouse? What keeps the sides together?

5. Do the ice cube and snowball melt alike?

FURTHER ACTIVITIES

MATERIALS AND RESOURCES

Dry tempera or food coloring
Baby food jars

PROCEDURE:

1. Place dry tempera in baby food jars and punch holes in the tops. If dry tempera is not available, use watered down food coloring.

2. Children are to shake paint a design or picture in the snow.

ENVIRONMENTAL DECISIONS

ENVIRONMENTAL EDUCATION

VALUES FOR THE FUTURE

ANTIOCH COMMUNITY SCHOOL DISTRICT 34

TITLE IVC ESEA

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EXPLANATION OF CONCEPT AREA

DECISIONS - For students to be effective in solving environmental problems they must have numerous experiences in a learning situation. By solving carefully selected problems they acquire the necessary skills and build their confidence.

Program activities begin by defining decisions and the responsibility for decisions.

In the second sequence we identify the aspects of sound decisions and their relationship to individual attitudes. We also explore the ideas of consequences and time span for decisions.

The junior high program attempts to identify the various components of complex decisions as they relate to decision-makers. From this we develop the ideas of effects and enforcement of decisions as they relate to individuals, society, and the law. We also begin to develop the concept of responsibility for decisions.

In high school we devote much of our efforts to involving students actively in the decision-making process. They are encouraged to practice their personal values and examine their relationship to society in general. Decisions take on new significance as the student becomes involved with groups whose interests may be different from his. We also explore the effect of using laws to effect environmental improvement.

BEHAVIORAL OBJECTIVE:

At the completion of this unit students will be able to explain how decisions are choices.

SUBJECT AREAS:

Social Studies, Science, Art, Language Arts

OPTION #1

MATERIALS AND RESOURCES

Ditto for each child

PROCEDURE:

1. Have the students take a position by a show of hands:

   Raised hand - agree
   Thumbs down - disagree
   Folded arms - no opinion

   Sample questions:

   How many of you like to come to school?
   How many of you have trouble in math?
   Do you think this school is pretty?

2. The teacher gives the children a set of items to be ranked with three or four alternatives.

   Sample:

   How would you like to be described? Leader, follower, always alone
   Which is most important? To be responsible, to obey, to be honest
   What do you like to eat best? Fruit, candy, vegetables

3. Have the children take a position by a show of hands as outlined above.

4. Distribute the ditto to the children and have them rank the following:

   Bully - beats up younger children

   Rat - tells on a friend

   Stealer - takes things that belong to others

   Cheater - cheats in games

   Firebug - sets fire to buildings

TEACHER SAMPLE:

FIREBUG
worst person STEALER
BULLY
CHEATER
RAT
not so bad

3

OPTION #1 con't

DISCUSSION QUESTIONS

1. What good or bad thoughts or feelings did you have about some of the things I asked you today?

2. Which questions did you have very strong feelings about?

3. How did your feelings and thoughts help you choose or make a decision?

4. Name some decisions you make every day and name the choices you have for making these decisions.

OPTION #1

BULLY - BEATS UP YOUNGER CHILDREN

RAT - TELLS ON A FRIEND

STEALER - TAKES THINGS THAT BELONG TO OTHERS

CHEATER - CHEATS IN GAMES

FIREBUG - SETS FIRE TO BUILDINGS

WORST
PERSON

NOT SO BAD

BULLY - BEATS UP YOUNGER CHILDREN

RAT - TELLS ON A FRIEND

STEALER - TAKES THINGS THAT BELONG TO OTHERS

CHEATER - CHEATS IN GAMES

FIREBUG - SETS FIRE TO BUILDINGS

WORST
PERSON

NOT SO BAD

5

OPTION #2 - NO SPECIFIC MATERIALS

PROCEDURE:

1. At the beginning of a week, explain to the class that they are going to write, draw, or discuss what they did over the weekend.

2. Have the children draw pictures and/or write about three activities they did over the weekend that they decided to do themselves - they made the decision to do it.

3. After each child has completed his drawing and/or description of the three activities, ask them to think about why they decided to do what they did. For instance, maybe one child decided to go to the nearby grocery store to buy some candy because his friends were going to the store too.

4. Now have them add their reasons to their descriptions either by writing them down or emphasizing their reason(s) in their drawing. For instance, the child who went to the store could include his friends in the picture and have them point to the grocery store.

5. After they have included their reasons in their descriptions, ask the children to list or include in their drawings all the possible activities they could have done instead of, for instance, going to the grocery store to buy candy.

6. Now have the children share their experiences and their reasons and the activities they did not choose with the rest of the class. The teacher could write or sketch different children's activities on the board and let the class see if they can come up with other possible activities the student might have chosen (considering money involved, whether other people were necessary to do the activity, parental consent, desire, etc.).

7. This activity could be used in other situations such as:

   a. How did you get to school today and why?
   b. What activities did the class do in the morning and why did the teacher or class or both decide on those activities over other possible activities?
   c. What did this class do during recess today? What choices did you have and why did you decide to do what you did?

DISCUSSION QUESTIONS

1. How many of you decided to do something because other people decided to do it also?

2. How many times have you done the same activity?

3. How was money a part of any decisions?

4. How many of you thought of choices first before decided what to do?

5. Example: Suppose a child decided to go to bed early. You might ask him:

OPTION #2 con't

a. Were you tired?
b. Was there nothing else to do?
c. Were you planning to do something the next day which required more sleep?
d. Do you ever decide to go to bed early without being told to do so?

6. Do you often, sometimes, or almost never think about several things to do before you decide on one thing to do?

FURTHER ACTIVITIES

Have the students decide what things they would like to have and then have them list the reasons why they can or cannot have them.

OPTION #3 - No specific materials

PROCEDURE:

1. Explain to the class that you will be reading some questions to them. Choose about five questions.
2. Read a questions and have each child record his/her choices on paper (a,b,c).
3. Tabulate the answers.
4. Repeat the questions and have the children respond with a show of hands.
5. Record their choices on the board.
6. Put both tabulations on the blackboard for comparison.

DISCUSSION QUESTIONS

1. How many made the very same choices both times?
2. What makes us choose what we do choose?
3. Would you always choose the same things each time?
4. Did you change because you could tell what others wanted?
5. If you have no choice, who usually makes the decision?
6. Why do we feel better when we have a choice of what to do?
7. Are the things we have to choose always fun to do?

OPTION 3 SAMPLE QUESTIONS

1. Which would you least like to be

   a. a teacher
   b. a bus driver
   c. a principal

2. Would you rather be a

   a. rock
   b. bird
   c. flower

3. Where would you rather be on a Sunday afternoon

   a. at the beach
   b. at the park
   c. at the grocery store

4. Which would you rather study

   a. science
   b. reading
   c. mathematics

5. Where would you rather live

   a. in a big city
   b. on a farm
   c. in a little town

6. Which do you like best

   a. ice cream
   b. jello
   c. chocolate cake

7. What would you rather own

   a. bicycle
   b. motorcycle
   c. minibike

8. Which pet would you rather have

   a. dog
   b. cat
   c. turtle

9. Where would you rather go on a vacation

   a. camping in the moutains
   b. visit Disneyland
   c. visit an aunt in a different city

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to explain why environmental decisions can be made by individuals or by groups.

SUBJECT AREAS:

Health, Social Studies, Mathematics

OPTION #1 - no specific materials needed

PROCEDURE:

1. Study the four basic food groups.
2. Study which foods are in each group and what nutritional value we receive from these foods.
3. Have the students consult a cafeteria menu and place these foods into the correct groups.
4. Have the students record their own meals for a week.

DISCUSSION QUESTIONS

1. Did the foods you ate follow a good diet?
2. What foods are served in the cafeteria?
3. Do cafeteria foods follow a good diet?
4. Why do we need different kinds of foods?
5. Who decides what you eat?
6. When do you get to decide what you eat?

OPTION #2 - no specific materials needed

PROCEDURE:

1. Have the students list their family members on a chart and their favorite foods.
2. Have the students find out which foods are the least expensive.
3. Read weights on the boxes of similar products. Decide which is the most economical. Decide which is the healthiest.
4. Vote on who likes which best.

DISCUSSION QUESTIONS

1. Can you buy fresh foods, such as fruits and vegetables, all year long?
2. What month(s) would be best to buy fresh foods?
3. Which foods are the most economical?
4. Why are some foods less expensive?
5. Which foods are the healthiest?
6. What are your favorite foods?
7. How much money can be spent on main dishes, treats, and sack lunches?
8. Which is better - store bought spaghetti, homemade spaghetti, or restaurant made spaghetti?
9. How are these choices important?

FURTHER ACTIVITY

MATERIALS AND RESOURCES

Sixty cents per student
Access to a grocery store or supermarket

PROCEDURE:

1. Explain to the class they are going to purchase some pop to drink.
2. Before any purchases are made, the teacher should discuss with the class as many possible decisions relating to buying pop as the class can think of.

   a. buying cans
   b. buying non-returnable bottles
   c. buying different flavors such as cola, root beer, cherry, orange, etc.
   d. buying returnable bottles
   e. buying no pop at all

3. The teacher should explain to the class that each student is allowed to make any decision he wishes. He or she can buy any pop he chooses or he may choose not to make a purchase.

4. It is best to have the children select their own pop, if any, rather than having someone else such as a parent or teacher buy it for them. In this way, they become confronted with the various choices themselves as they would be if they dropped by a store by themselves or with friends to buy some pop.

5. After the class has returned with their pop, discussion can take place with the teacher writing the various reasons for buying certain types of pop and in various containers on the board.

6. The teacher should then help the students, if necessary, to come up with possible reasons for making one decision over another such as:

   a. buying a can because it was cheaper or the flavor the student wanted only came in cans.
   b. buying a returnable bottle because the bottle can be used again and not just thrown away.

7. After discussion the class should come to a common decision acceptable to everyone in some way on how to spend their remaining money for tomorrow's lunch.

8. Once a decision is made on how to spend the remaining "pop money", carry out the decision by buying or not buying a certain kind of pop in a certain type of container.

DISCUSSION QUESTIONS

1. What made each student buy or not buy whatever they bought?

2. Was the students' choice thought out or determined by habit, taste, or whim?

3. Was the common decision the same as the individual decision that was in the majority?

4. Was the common decision thought out or determined by habit, taste, or whim?

5. Was there a benefit, money-wise, in buying pop individually or collectively as a class? Maybe individually almost half the class would rather not spend the money for pop, whereas, the class decided to buy pop. Figure out exactly how much money was spent each time collectively.

OPTION #3

MATERIALS AND RESOURCES

Empty food containers
Shelves or boxes to be used as shelves
Play money
Old adding machine (optional)

PROCEDURE:

1. Children are to collect containers from home and bring them to school.

2. If shelves are not available, set up boxes to resemble shelves of a store and place the containers on the shelves.

3. Prices will be marked on the containers and the children should be assigned as store clerks as the teacher decides.

4. The children will receive specific amounts of money.

   a. They all may get the same amount of money.
   b. They each may receive a different amount of money.
   c. Each child is paid according to the work he performs in class.

5. The teacher may choose to introduce the unit in any of the following ways:

   a. Let the children begin with making purchases without prior discussion of decision, choices, or why we go to the store. After the purchases have been made then such a discussion can begin.

   b. Discuss where the food comes from as involved with social studies or science.

   c. Involve the class ahead of time in the differences of containers and environmental choices.

   d. Prior to purchasing have the class discuss why they go to the store, decision and choice making, etc.

6. After the children have their money, they can use the store.

7. After the children have spent their money, divide the containers they purchased into the materials they are made from.

8. Chart or list the materials.

9. Decide which materials are reusable, non-reusable, which deteriorate and which do not deteriorate.

OPTION #3 con't

DISCUSSION QUESTIONS

1. Why are different materials used?
2. What is meant by reusable, throwaway, returnable?
3. Do some packages get decayed or rotten outside?
4. What packages do not get rotten or decayed outside?
5. How can these affect our environment?

ADDITIONAL ACTIVITIES

1. Divide the containers and bag some in plastic and some in paper. Place outside and see what occurs.
2. Burn some materials and wet others. Compare the results.

FURTHER ACTIVITIES

MATERIALS AND RESOURCES

Same as in Option #3

PROCEDURE:

1. Set up the store shelves as in option #3.
2. After the children have their money, they may use the store.
3. Compare how much they spend and what they have purchased.
4. Now the children may plan a menu and make their purchases accordingly.
5. Repeat step #3.
6. Plan a menu to spend a certain amount of money.
7. Repeat step #3.
8. Compare weights and sizes and find out which is the best buy.

DISCUSSION QUESTIONS

1. Why is money necessary?
2. How did we have to decide what to do with our money?
3. Why did we spend what we did?
4. What would be done and why with the surplus money?
5. Why is the weight and size important?

FURTHER ACTIVITIES con't

1. Discuss the occupations that have been involved in this unit.

   MONEY: Banker, Storekeeper, clerks, butcher

   CONTAINERS: Lumbermen, steel or metal workers, plastic

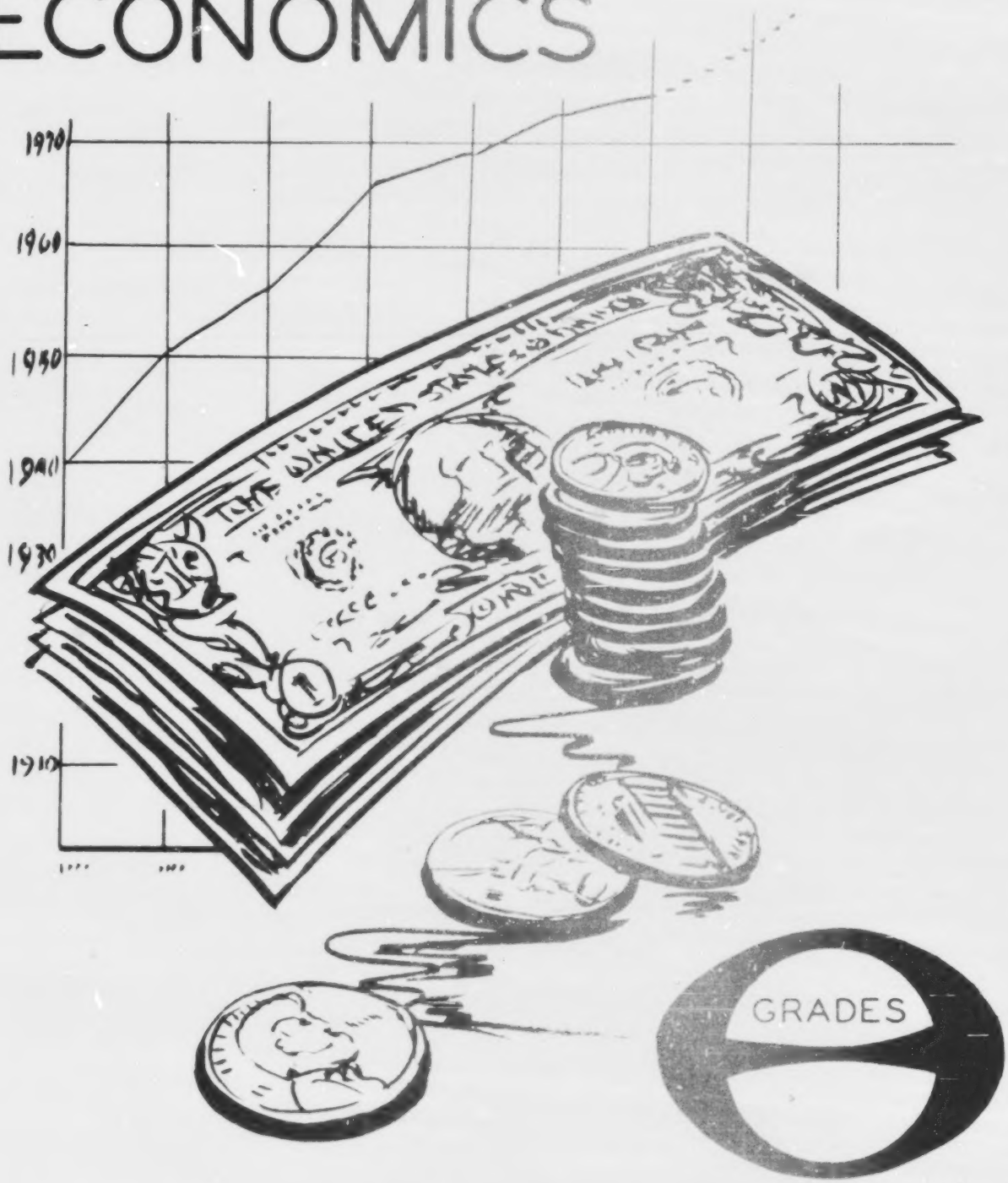
   FOOD CHOICES: Farmer, beekeeper, orchard owner, trucker, machine mechanic, plumber, electrician, carpenter

2. Collect pictures of various occupations. Make an occupations collage.

3. Discover parents' occupations. Write a story: My father or My mother -

4. Write a story "When I grow up I want to be.....

ECONOMICS



ENVIRONMENTAL EDUCATION

VALUES FOR THE FUTURE

ANTIOCH COMMUNITY SCHOOL DISTRICT 34

TITLE IV C ESEA

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Explanation of Concept Area..... 1

Synopsis

Economics 1: At the completion of this unit the student will be able to explain that money earned from work pays for our possessions.

Option 1 - The children use the story of The Ant and the Grasshopper to define the necessity of work. ... 3

Option 2 - The children experience money distribution through their choice of basic necessities, food, clothing, and shelter.. 4

Option 3 - The children make choices in spending and budgeting for privileges within the classroom. ... 6

Economics 2: At the completion of this unit the student will be able to explain that everyone does not have the same amount of money.

Option 1 - Discussion of the meaning of payday clarifies the fact that everyone is not paid the same amount. ... 8

Option 2 - The children role-play the family as a consumer unit. Each family is allotted the same amount of money. ... 9

Option 3 - Each "family" group is allotted different amounts of money to spend on necessities and luxuries. ... 10

EXPLANATION OF CONCEPT AREA

ECONOMICS - To develop a good understanding of the decisions that will be made concerning our environment we must understand some basic economics.

We begin the study of economics with the identification of sources of money and how it is distributed. The concrete facts of money as it relates to our daily lives.

These are further developed into an understanding of wages being a result of work and the importance of man's use for resources. We then develop the basics of supply and demand by examining the role advertising and its importance to demand.

In grades 6-8 we explore the standard of living in relation to the level of technology and economic system developed by the society. This knowledge is then expanded to assess the role of economics in determining environmental quality.

In high school we explore economic systems, levels of benefits, and the use of the cost/benefit equation to assess the merit of technology in modifying the environmental quality.

ECONOMICS 1

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to explain that money earned from work pays for our possessions.

SUBJECT AREAS:

Language Arts, Social Studies, Mathematics, Art

OPTION #1

MATERIALS AND RESOURCES

The Ant and the Grasshopper fable book or
May I Come In, from Ginn 360 Reading Series, Level 5
Record
Energy Ant Coloring and Activity Books (free to schools):

Federal Energy Administration
Energy Ant
Washington, DC 20461

PROCEDURE:

1. Begin the unit with the story and/or the record.

2. Let the children write or tell a different ending.

DISCUSSION QUESTIONS

1. Why were the ants working?

2. Was the grasshopper working?

3. What did he do all day?

4. What happened to the ants when winter came?

5. What happened to the grasshopper when winter came?

6. Did the ants have plenty of food?

7. Did the grasshopper get enough to eat?

8. Did the ant give him food?

9. What happened to the grasshopper?

10. Does someone at your house have to work so you can eat?

11. What do you need to get food?

FURTHER ACTIVITIES

Have the children draw the ant and the grasshopper and/or what their parents do for a living.

OPTION #2

MATERIALS AND RESOURCES

Ten bingo chips or paper circles for each child, paste
One ditto for each child

PROCEDURE:

1. Discuss with the children that money from their homes must cover the necessities of food, shelter, and clothing.

2. Distribute chips or circles and the ditto.

3. Explain to the children that they are to pick one of each - food, shelter, and clothing. With only ten circles they will not be able to get the most of everything. They do not have to spend all their circles, however.

4. Place circles on each choice and save the leftovers.

5. Paste down the circles after checking that a picture has been chosen in each row.

6. Discuss the choices the children have made.

DISCUSSION QUESTIONS

1. How many chose the largest house, the most clothes and the most food? Why?

2. How many chose the middle house, middle clothes and the middle food? Why? Were any chips left over?

3. How many chose the smallest house, the least clothing and food? Why? How many chips remained?

4. What did you choose from food, clothing, and homes if different from the above? Why?

FURTHER ACTIVITIES:

1. Extra privileges may be awarded by leftover points.

2. The children may choose luxuries valued below and then color their choice.

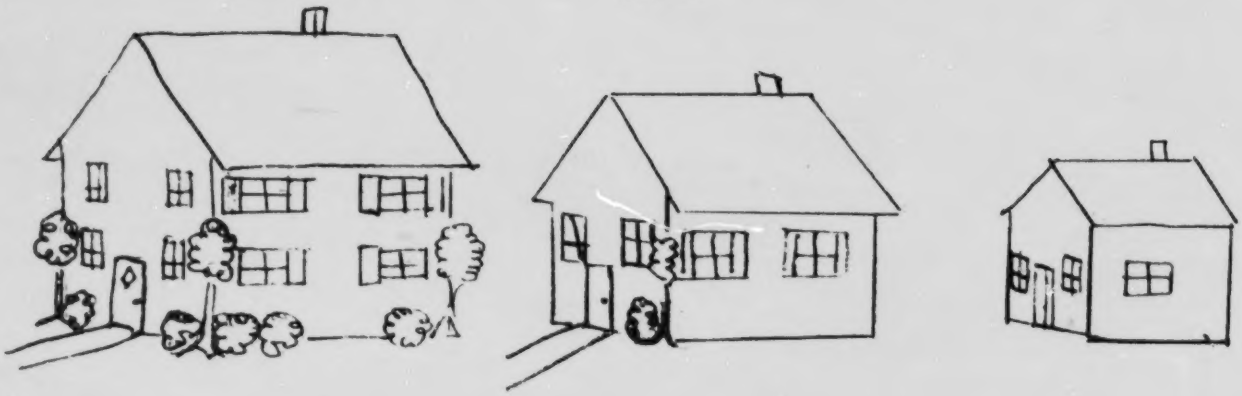
Automobiles	- 4 circles	Television	- 3 circles
Bicycle	- 2 circles	Toy	- 1 circle

Children may choose any combination adding up to a maximum of four.

4

OPTION #2

HOMES



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CLOTHING

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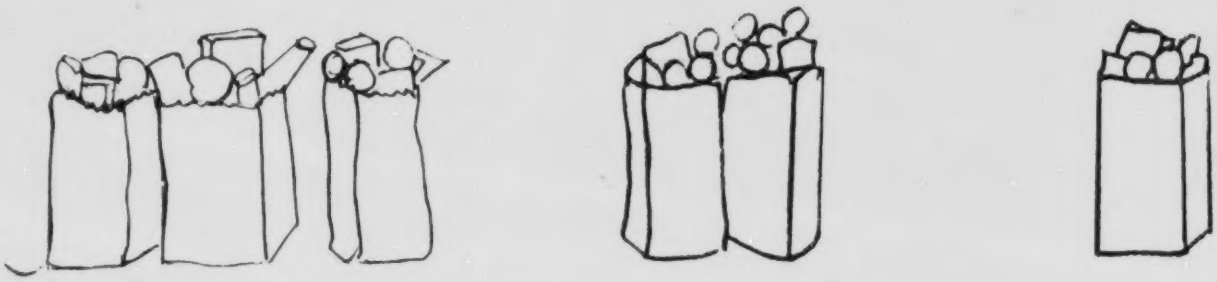
FOOD



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OPTION #3

MATERIALS AND RESOURCES

Ten poker chips per child

PROCEDURE:

1. Give each child ten poker chips.

2. For a specific amount of time the child may buy certain privileges in the room designated by the teacher. The things the children like to do the most cost chips.

Listening center	- 3	Drinking fountain	- 3	Reading a book	- 1
Pencil sharpener	- 3	Coloring sheets	- 2		

3. One child is appointed to be the banker to collect the chips as they are used to "buy" privileges.

DISCUSSION QUESTIONS

1. How many children have chips left in their hands?

2. Were you able to do what you wanted to do?

3. Did you have enough chips? If not, tell me what you did with yours?

4. If we did this again sometime, would you spend your chips in the same way?

5. Can you understand a little better now why sometimes your parents say, "No, we cannot afford to buy that ....."

ECONOMICS 2

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to explain that everyone does not have the same amount of money.

SUBJECT AREAS:

Mathematics, Social Studies

OPTION #1 - No materials necessary

PROCEDURE:

Discuss the meaning of PAYDAY with the children.

DISCUSSION QUESTIONS

1. What is payday?
2. When is payday?
3. Who gets paid in your family?
4. How do they get paid?
5. Do you get paid? If so, what are you paid for?
6. Does everyone receive the same amount of money? If not, why not?

OPTION #2

MATERIALS AND RESOURCES

One package of play money bills
One envelope containing $250 in play money for each group

PROCEDURE:

1. Group the children into families. Have each group decide who will represent mother, father, and children.

2. Each group is to decide what things are important and must be purchased.

3. Either give them a list or list on the blackboard the following examples:

   Housing Food Automobile Clothing Etc.

4. Place costs on each of the above.

   Clothing $20 Housing $100 Food $25 Auto $50

5. Give each group $250 in play money in an envelope.

6. Do not alter the costs. If food is to be established at $25, students must pay that much for food and no less.

7. After the children have made their purchases or paid their bills, have them list luxuries and set price values on these items.

8. Have them vote on what they would want to purchase with any money that might be left over.

9. Have each group pay some emergency expense, i.e. car, medical, fire, etc.

DISCUSSION QUESTIONS

1. What do you need every week in order to live?

2. Which one costs the most?

3. Do you have any money left over?

4. How are you going to get to work each day?

5. Do you need a car?

6. Does it cost money?

7. What would you do with your extra money?

8. When should money be saved?

9. Was there money in the envelope, enough to cover everything?

10. How do families handle emergencies that take away savings?

OPTION #3

MATERIALS AND RESOURCES

One package of play money bills
The envelopes should contain differing amounts of money - for example, one of $250, one of $240, and one of $230, etc.

PROCEDURE:

1. Have each group select two persons, one to represent a father and one to represent a mother.

2. Each group is to decide what things are important and must be purchased.

3. List these on the blackboard with costs:

   Clothing $20 Housing $100 Food $25 Auto $50

4. After the children have made their purchases or paid their bills, have them purchase luxuries:

   Bike $60 Vacation $75 Pop, candy, snacks $10 Camera $30
   Pinball Game $20

   (The sheet attached represents these luxury items and can be handed to the students as they give the teachers the money.)

DISCUSSION QUESTIONS

1. Which things do you need every week in order to live?

2. Which one costs the most?

3. Did you have any money left over?

4. How are you going to get to work every day?

5. Do you need a car?

6. What would you do if you had extra money?

7. When should money be saved?

8. Which group purchased the most things? Why?

OPTION #3

CLOTHING $20	HOUSING $100
FOOD $25	AUTO $50
BICYCLE $60	VACATION $75
SNACKS $10	CAMERA $30
PINBALL MACHINE GAME $20	WAGON $5

ECOSYSTEMS

GRADES

ENVIRONMENTAL EDUCATION

VALUES FOR THE FUTURE

ANTIOCH COMMUNITY SCHOOL DISTRICT 34
TITLE IVC ESEA

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Time of the Year Notes

Ecosystems 1, Option 1 - Spring or Fall 3
Ecosystems 4, Option 1 - Spring or Fall 27

Synopsis

Ecosystems 1: At the completion of this unit the student will be able to explain why the sun is the basic source for all life in every ecosystem.

Option 1 - By the use of a simple science experiment the children will see water vapor form droplets caused by heat from the sun. 3
Option 2 - The children explain how heat from the sun is a form of energy through observation. .. 4
Option 3 - The children observe energy from the sun affects a change in water vapor. .. 5

Ecosystems 2: At the completion of this unit the student will be able to explain why the world can be thought of as one large ecosystem or spaceship with a number of smaller ecosystems making up its parts.

Option 1 - A classroom model of an ecosystem with water is set up and used by the children to explain an ecosystem. .. 7
Option 2 - The children use a spaceship as an example of an ecosystem and establish the basics needed to survive. .. 9
Option 3 - Children observe a model of land plants and animals to explain the make-up of an ecosystem. .. 14

Ecosystems 3: At the completion of this unit the student will be able to locate an ecosystem.

Option 1 - The children use a forest mural to chart the animal that lives in a forest community. .. 19
Option 2 - The children use two murals, ocean, pond, or desert, to chart which animals live in that community and make comparisons. .. 20
Option 3 - The children draw a mural of their own locality and chart the animal life. .. 21

Ecosystems 4: At the completion of this unit the student will be able to demonstrate that some animals eat plants, some animals eat other animals, and some animals eat both plants and animals, like man.

Option 1 - The children observe in a controlled situation which animals eat plants and which eat animals. .. 27
Option 2 - The children categorize plant and animal eaters. .. 28
Option 3 - The children choose and study an animal on a school walk... 29

EXPLANATION OF CONCEPT AREA

ECOSYSTEMS - In any program of environmental education we must include material to help students develop a clearer understanding of basic ecological principles.

We begin this process by defining the basic components of a simple system, its energy source, definition, and basic relationships.

We then build upon this to define place, energy, interactions, and the problems of pollution of ecosystems.

In grades 6-8 we focus on the complexity of ecosystems, energy forms and transfer in ecosystems, and the stress capacity of ecosystems.

In high school the students use their previous experiences to further explore the structure of ecosystems, their dynamic nature, and the interactions between humans and ecosystems.

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to explain why the sun is the basic source for all life in every ecosystem.

SUBJECT AREA:

Science

OPTION #1 - Time of Year: Early Fall or Late Spring

MATERIALS AND RESOURCES

A shovel
Black plastic
Four rocks
Pie Pan

PROCEDURE:

1. Explain to the children that they are going to find out what causes rain.
2. Early in the day, dig a hole in an unused portion of the playground and have the children see if the earth is moist or dry.
3. Place the pie pan in the bottom of the hole.
4. Place the dry plastic over the hole.
5. Anchor the plastic with four large rocks.
6. Leave the plastic untouched for several hours.
7. Lift the plastic and water should be found in the pie pan.
8. Have the children touch the plastic to see how warm it is.

DISCUSSION QUESTIONS:

1. Where did the water come from?
2. Was the plastic hot or cold?
3. How did the water form?
4. What is the source of energy that all living things need?
5. What does this event remind you of? How does grass feel very early in the morning?
6. What might cause this to happen during the night?
7. Why doesn't the grass feel wet in the daytime?

FURTHER ACTIVITIES:

Procedure:
1. Place a few drops of water in pie pan.
2. Place in the sunlight on a warm day.
3. At the end of the day check to see what happened to the water.

Questions:
1. What happened to the water?
2. Why did it disappear or evaporate?
3. What made the difference in the pie pan we placed in the ground without water and the one outside that had water?

OPTION #2

MATERIALS AND RESOURCES

A radiometer or candle driven mobile
A goose neck lamp or a flashlight

PROCEDURE:

1. The teacher is to demonstrate the use of the radiometer by alternately shining a light on it, then removing the source of light.
2. The radiometer will start revolving once the light shines on it.
3. Place the radiometer in sunlight.

DISCUSSION QUESTIONS:

1. What happened when the light shown on the radiometer?
2. What happened when the light was turned off?
3. What do you think would happen if two lights were used if they were on opposite sides?
4. What happened when sunlight was used?
5. Which light made the radiometer go faster?
6. What light makes all things grow? Sunlight or electric?
7. How could we use this motion for our work?

FURTHER ACTIVITIES:

Materials and Resources Needed: A Palm Glass - a/k/a Pulse Glass - available with ISCS material - must be alcohol solution type

Ring Stand and Clamp

Procedure:
1. Attach the palm glass to the clamp on the ring stand and place the entire apparatus in the window.
2. Let the children observe the liquid moving up the tube.

Questions:
1. What happened when the sunlight touched the liquid?
2. Where did the liquid go?
3. What happened when the sunlight did not shine on the palm glass?
4. Where does the light for all living things come from?

OPTION #3

MATERIALS AND RESOURCES

A Plant
Clear plastic bag
A Rubber Band or plastic tie

PROCEDURE:

1. Water the plant and place it in a plastic bag.
2. Tie the bag at the top with the rubber band or plastic tie.
3. Put the plant on a window ledge.
4. Have the students observe the plant for several days.

DISCUSSION QUESTIONS:

1. Where did the water come from?
2. Was the plastic hot or cold to touch?
3. Where did the energy come from to cause the water to form?
4. What would happen to the water if the plant did not have a plastic cover?
5. What is the source of energy all living things need to grow?

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to explain why the world can be thought of as one large ecosystem or spaceship with a number of smaller ecosystems making up its parts.

SUBJECT AREAS:

Science, Art, Language Arts

OPTION #1

MATERIALS AND RESOURCES

Sand and water
Aquarium Plants
Snails
Gallon jar with cover or aquarium with tight cover

Life in an Aquarium #133
Life in a Terrarium #142
} Popular Science Audio-Visual Div.

PROCEDURE:

1. Set up aquarium with enough sand to anchor plants.
2. Add water and let it stand for 48 hours.
3. Add plants and snails and seal the jar.
4. The plants and snails will arrive at a balanced state of survival on their own and may be kept for an indefinite amount of time depending on the size of each part of the ecosystem.
5. Have children observe the aquarium.
6. Introduce vocabulary adequate for the age level.

GLOSSARY

Model - A small representation of a larger idea

Earth - The plant on which we exist, a closed ecosystem

Ecosystem - An ecosystem consists of all the plant and animals in a given area interacting with their non-living environment

Closed "Ecosystem" - Contains all the air, water, land we will ever have

Soil - Land

Water - Seas, rivers, etc.

Air - Atmosphere

Note: Do not allow the misconception that the earth is actually enclosed by a covering.

Note to teacher: The aquarium is balanced by plants, animals, sunlight, water, and oxygen. Without the plants the snails would have no food nor any means to reverse the CO_2 back to O_2. Likewise without snails the plants would have no CO_2 and the algae growth would cause light blockage and plant kill. The lack of sunlight, water and O_2 is obvious.

OPTION #1 - Cont'd

DISCUSSION QUESTIONS:

1. What is a model?
2. Did anything escape?
3. Was anything added?
4. What things do we all need to live?
5. Does the earth have all these things?
6. What things did we put in our model?
7. Does our model have all the things needed?
8. What makes the plants grow?
9. Could the animals, snails, live without any of the other things - food (plants), water, sunlight.
10. Could the plants live without the snails?

OPTION #2

MATERIALS AND RESOURCES

A spaceship made from posterboard (optional)

Three sets of 24 cards with the following pictures drawn and labeled:

pencil	bed	sunglasses	pajamas	television
radio	food	telescope	purse	spacesuit
air	car	telephone	money	ball
sled	water	umbrella	dog	roller skates
bags	camera	bicycle		light

Space Travel, Willy Ley
Space, Willy Ley
Space, M. Tellander
The First Book of Space Travel, J. Bendick

PROCEDURE:

1. Divide the class into three groups. Give each group a set of 24 cards.
2. Tell the class that they are preparing for a trip into outer space. They will need to take with them the things that will keep them alive in space.
3. We can only take 5 things from the list because of limited space. From the stack of 24 cards, each group must choose the 5 things to take along. Allow enough time for each group to decide among themselves.
4. When the decisions have been made, have each group turn in their choices. List the choices for each group, one at a time and discuss.
5. When all the groups have been heard from, the group that comes closest to or has all the necessities is the winner.

   Correct Choices: Air, water, food, spacesuit, light

DISCUSSION QUESTIONS: (To be asked of each group)

1. Why did you choose the items you chose?
2. Can you live without any of the items you chose?
3. Is one of the 5 the most important?
4. Where can you find these things on earth?
5. Is there something we need for life which we cannot find on earth?

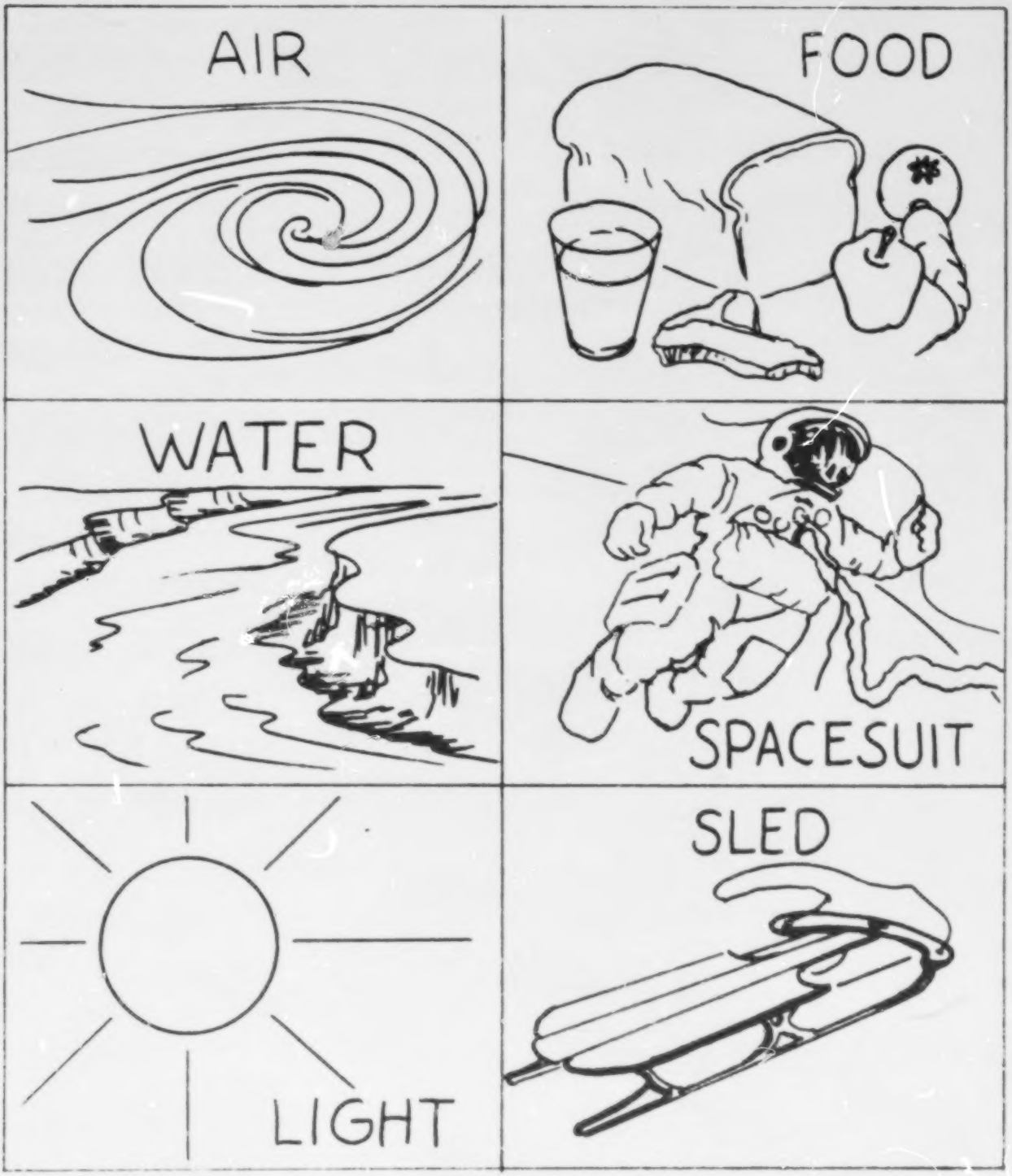
FURTHER ACTIVITIES:

1. Look for pictures of space travel and exploration.
2. Have the students draw pictures of what they think a spaceship should look like.

OPTION #2

OPTION #2

OPTION #2

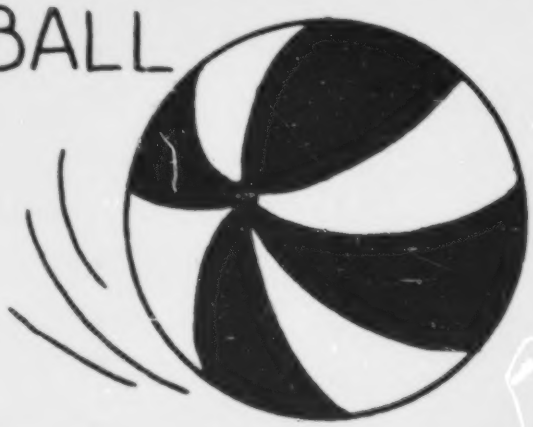


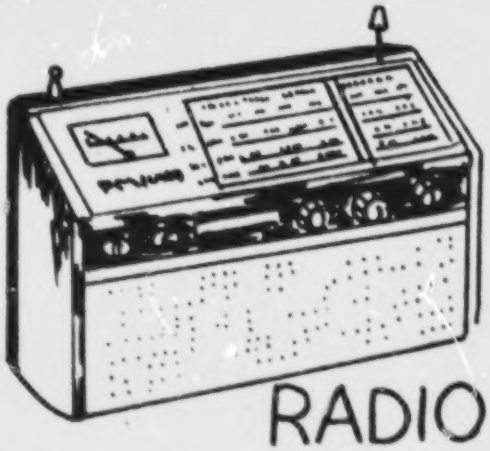
OPTION #2

MONEY

TELEVISION

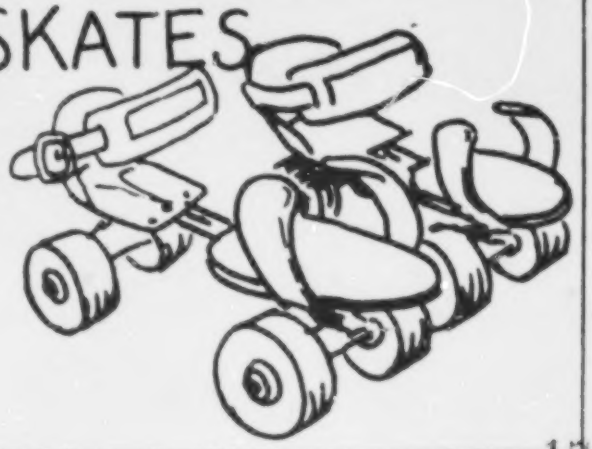
BALL





RADIO

SKATES



DOG

OPTION #3

MATERIALS AND RESOURCES

aquarium with cover (box with a plastic liner alternative)
soil
gravel
plant Gro-Light
gerbil
water container (margarine tub suitable)
bird seed, bean sprout seeds, lettuce seeds
aluminum foil
red cellophane

PROCEDURE:

1. Prepare aquarium as follows:

   a. Place a thin layer of gravel on the bottom
   b. Over this place a few inches of soil
   c. Plant the seeds and water them
   d. Place water container into the soil so it cannot tip
   e. Now suspend the light and cover
   f. Wrap the glass sides with the foil except for several viewing areas
   g. Cover the viewing areas with red cellophane to block out all natural light.

2. After the seeds have germinated, put in the gerbil, fill the water container and water plants.

3. Have the children observe the ecosystem and see how long it is self-supporting. (Add water if necessary)

DISCUSSION QUESTIONS:

1. What did the plants need to grow?

2. If we took anything out - water, air or light - would the plants live?

3. What keeps the gerbil alive?

4. Could we take away any of the things in the ecosystem without hurting the gerbil?

5. Do we need the same things as the gerbil to stay alive?

ALTERNATIVE OPTION #3 - Hydroponic Garden

MATERIALS AND RESOURCES

Large jars
Plastic cups
Commercial plant food
Black paper (enough to cover jars)
Coleus seeds or plant slips
Tape, scissors and
Water to fill jars

PROCEDURE:

1. Punch a hole in the bottom of the cup.

   a. For seeds, fill the bottom of the cup with cotton and place 3 seeds on the cotton.
   b. For plant slips, put the stem into the hole of the cup and support the rest of the stem with cotton.

2. Fill the jar with water almost to the top (see teacher's notes) and add plant food.

3. Put the cup in the top of the jar and add more water until jar is filled. See figure below. Note: For seeds, the seeds should be damp but not covered with water solution. For slips, the tip of the stem only should be covered.

4. Wrap the jar with black paper because roots need darkness to grow. Later paper may be removed.

Note to Teacher:

a. Use plastic cups to avoid mildew. It is possible for seeds and root systems to drown. To avoid this lift the cups and agitate the water during the day to insure adequate oxygen supply.

b. The solution in each jar may be changed by adding different amounts of plant food to each jar. Label each jar with the amount of plant food added. The plants with the least food will be smallest and vice-versa.

ALTERNATIVE OPTION #3 - Cont'd

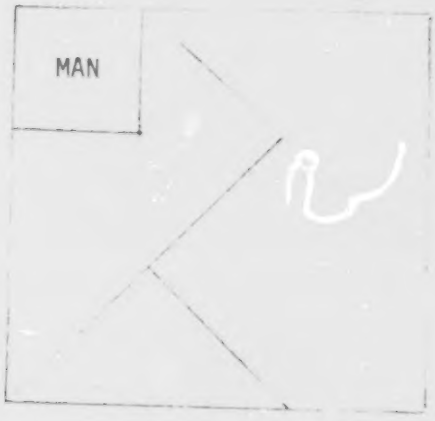
DISCUSSION QUESTIONS:

1. What do plants need to grow?
2. Why did some plants grow better than others?
3. Could the plants live if we took any of the things away?
4. Do we need the same things to live as a plant?
5. Why do we need plants?

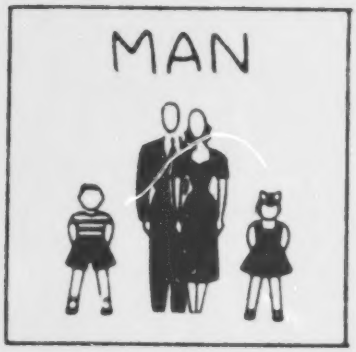
FURTHER ACTIVITY:

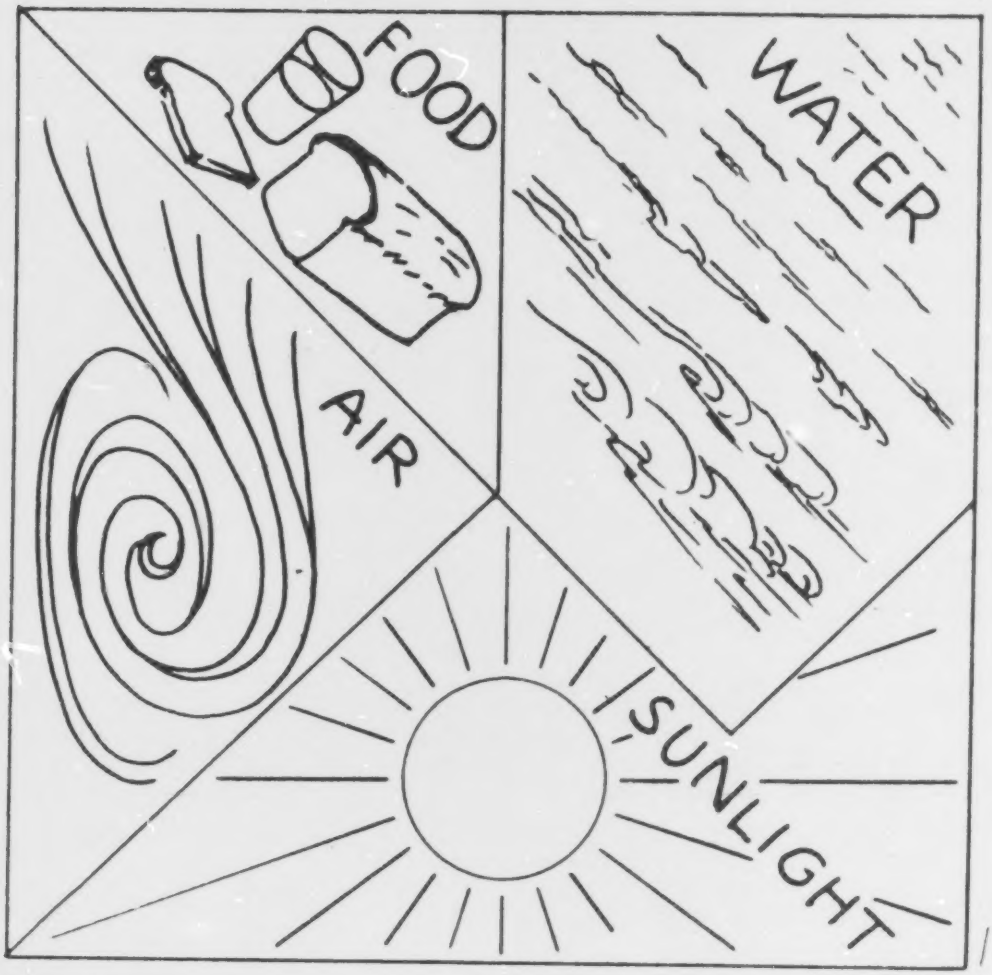
1. Keep charts to record the growth of each plant.
2. Grow a vegetable hydroponically; i.e. tomatoes or beans.
3. Have the children think about why plants should be grown this way. Man might have to grow food this way if the earth is too crowded in underground housing, space stations or under the ocean. Draw pictures and/or write stories with these ideas.
4. To further illustrate the parts of the ecosystem, have the students put the puzzle together with Man part of the puzzle.

SOLUTION:



OPTION #3 PUZZLE DITTO





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ECOSYSTEMS 3

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to locate an ecosystem.

SUBJECT AREAS:

Science, Social Studies

OPTION #1

MATERIALS AND RESOURCES

SVE "Communites in Nature", Set of Four Murals available at Environmental Education Office

PROCEDURE:

1. Choose forest chart and display ahead of time.
2. Have the children place animals on the mural.
3. Discuss why they placed the animals where they did.

DISCUSSION QUESTIONS:

1. What is the animal doing - walking, running, etc.?
2. Does the stance determine where the animal should be?
3. Where did you put the animal? Why?
4. Did the positions of the animals change from day to day? Why or why not?
5. Could you find these animals somewhere else where they are free and wild?
6. Can you name what these animals eat?

FURTHER ACTIVITY:

Continue the same as Option #1 with any or all the murals in the set. Use the same discussion questions as in Option #1.

OPTION #2

MATERIALS AND RESOURCES

SVE "Communities in Nature", Available at Environmental Education Office

PROCEDURE:

1. After the first option is completed put up a second mural simultaneously.
2. Have the children arrange the animals on the second mural.*
3. Discuss animal placement.
4. Compare the two murals and the placement of the animals.

DISCUSSION QUESTIONS:

1. Could any animal be on either chart? Why?
2. Which animals cannot be in either place? Why?

* If the teacher would prefer to use vinyl, the vinyl sheet may be placed over the mural. Animals may be drawn on vinyl squares with magic marker or grease pencil.

OPTION #3

MATERIALS AND RESOURCES

Drawing Supplies

PROCEDURE:

1. Have the children draw their own mural of their own locality.

2. The children may draw or trace their own animal and paste them on the mural or cut out magazine pictures and paste them on.

DISCUSSION QUESTIONS:

1. What kind of land is there where you live? (Hilly, smooth, ponds, forest, etc.)

2. What kind of plants are where you live?

3. What kind of animals are where you live?

4. What kinds of houses do these animals make?

5. What is your favorite kind of animal? Why?

UNIT POST-TEST:

Have a sheet of animal pictures. Some animals will belong in a particular area and others will be foreign to that area. Have the children color only those animals that belong.

POST TEST FOR A FOREST COMMUNITY

POST TEST FOR A DESERT COMMUNITY

POST TEST FOR A POND COMMUNITY

POST TEST FOR AN
OCEAN COMMUNITY

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to demonstrate that some animals eat plants, some animals eat other animals, and some animals eat both plants and animals, like man.

SUBJECT AREAS:

Science, Language Arts, Art

OPTION #1 - Fall or springtime

MATERIALS AND RESOURCES

Three (3) one gallon jars
Grasshoppers or a mouse
Praying mantis or spider
Turtle or salamander
Small insects
Grass
Corn
Worms
Water dish

NOTE: Praying Mantis egg cases may be ordered from nurseries and insectaries. They will be delivered early in the spring.

PROCEDURE:

1. Label the jars #1, #2, and #3.
2. In jar #1 place the mouse with the corn and water or the grasshopper and the grass.
3. In jar #2 place the praying mantis or spider with the insects.
4. In jar #3 place a turtle or salamander and the worms.
5. Have the children observe what happens in each jar.
6. Have each child write a story of what they saw happening.
7. Have some or all of the children read their stories aloud to the class.

DISCUSSION QUESTIONS

1. In each of the three jars what did the animal(s) eat?
2. Which things are plants and which are animals?
3. What things do you eat?
4. Which animal is most like you in your eating habits?

OPTION #2

MATERIALS AND RESOURCES

Magazines
Posterboard
Tape or paste
Scissors

PROCEDURE

1. Print the words below on the blackboard:

Cow	Horse	Cat	Dog	Deer	Frog
Mouse	Rabbit	People	Bee	Raccoon	Bear

2. Have the students find out what each of these animals eat. Behind each animal's name write either plants or animals.

3. Find pictures of the animals and pictures of the things they eat. If you cannot find the animal's picture, just write the name on a piece of posterboard.

4. Paste the animals and the food pictures on the posterboard.

DISCUSSION QUESTIONS

1. Which animals eat just plants?

2. Which animals eat just animals?

3. Which animals eat both plants and animals?

4. Which animals are most like people?

FURTHER ACTIVITY

1. Visit a zoo preferably at feeding time. Have the students observe what the animals are eating. Make certain you see animals that eat both plants and animals. Use discussion questions listed above.

2. Have the children make a collage of pictures of animals and food they eat.

OPTION #3 - no specific materials

PROCEDURE:

1. Prepare the students for making their own wildlife investigations by taking them on a quiet walk to observe animals around the school. Tell them to be very quiet and try to see as much as possible.

2. Return to the classroom and discuss what they saw. Draw attention to who saw the largest and smallest animal, who saw animals eating or playing, who saw the best hidden animal, etc.

3. Now tell them that you want them to each select an animal or species to watch for a period of two weeks. They are to spend at least fifteen minutes every day watching their animal to learn what it eats, where it lives, and any other information that makes it special.

DISCUSSION QUESTIONS

1. What made your animal neat to watch?

2. What made it hard to watch? Did you watch one animal or a lot of animals of the same kind?

3. What did your animal eat? Plants? Animals? Either one? How did you find out?

4. What animal are you most like? Explain.

5. Can you write a poem about your animal?

FURTHER ACTIVITIES

MATERIALS AND RESOURCES

Chart paper or posterboard
Magazines and/or drawing paper

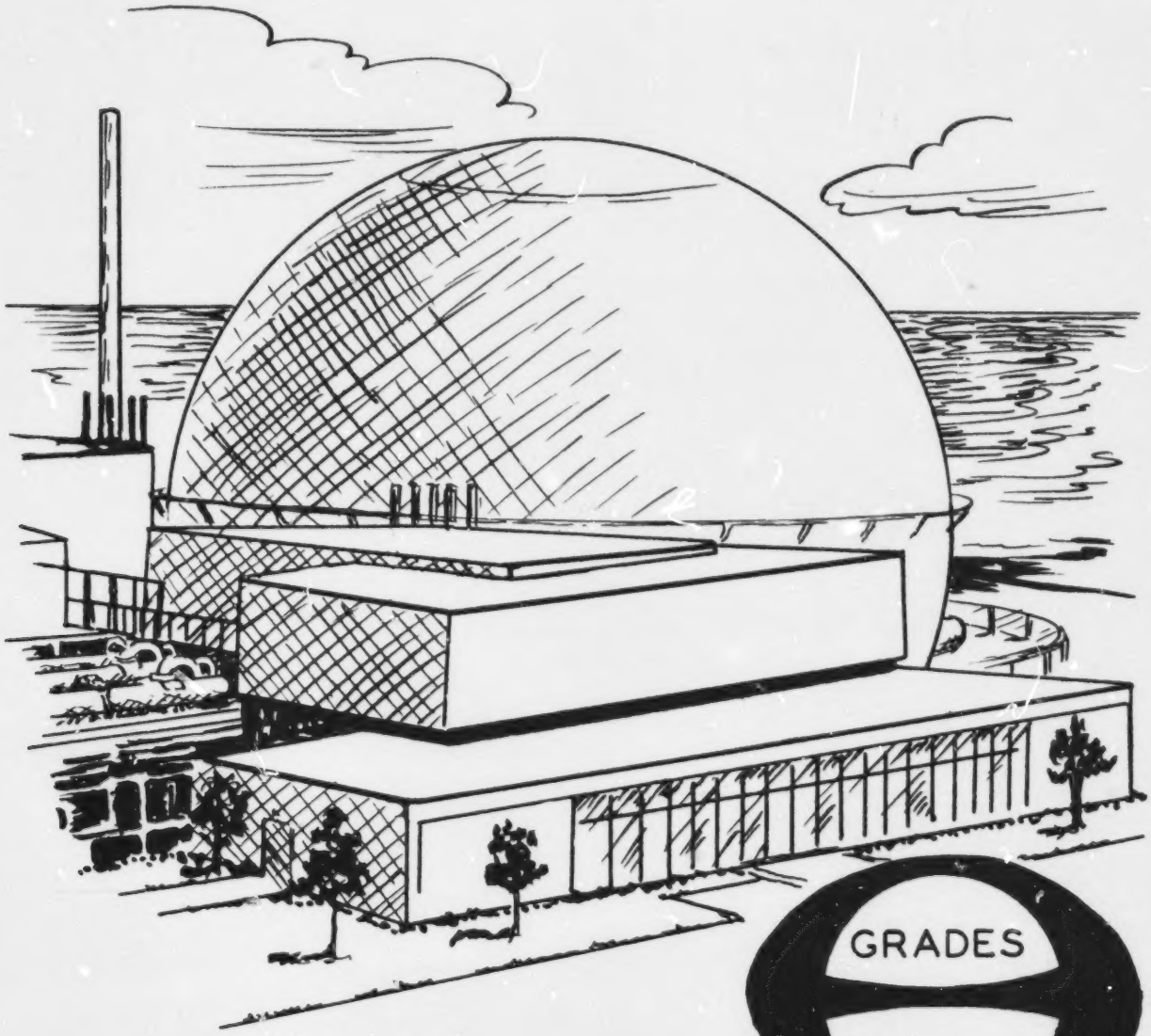
PROCEDURE:

1. List some foods people eat.

2. Chart these as PLANT or ANIMAL.

3. Find magazine pictures or make drawings of these foods and then what animals or plants give us these foods.

ENERGY



GRADES 8

ENVIRONMENTAL EDUCATION

VALUES FOR THE FUTURE

ANTIOCH COMMUNITY SCHOOL DISTRICT 34

TITLE IVC ESEA

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Page

Explanation of Concept Area 1

Time of the Year Notes

Energy 2, Option 3 - Wintertime .....

Synopsis

Energy 1: At the completion of this unit the students will be able to explain why the sun is the source of all energy.

Option 1 - The children use a game which develops the premise that the sun is the most important part of life. ... 3
Option 2 - Through the use of a game the children identify the sun as the source of energy upon which all life is dependent. ... 6
Option 3 - The students create a mobile with the sun as the most fundamental part of the life chain. ... 9

Energy 2: At the completion of this unit the students will be able to explain why all living things need energy.

Option 1 - The children use three plants under control conditions to explain how a plant receives energy from the sun. ... 15
Option 2 - The children resolve the problem that living things need energy with the use of an open-ended story. ... 16
Option 3 - The children personally experience how cold affects their need for energy. ... 17

EXPLANATION OF CONCEPT AREA

ENERGY - The need for students to understand more about the concept of energy is obvious with all the controversy in recent months.

In dealing with energy, we begin with merely identifying the Sun as the primary source and establishing our need for energy.

We then help the student to discover the ways energy is used by organisms, including man. This is then built upon to identify the various forms of stored energy and the conversions necessary for effective use of energy.

In the junior high we discuss the effect of culture in determining energy needs. Students then explore the ways we lose energy, the scope of the problem, and future needs and forms of energy.

In high school we explore the various aspects of energy in depth. This deals with usage in the United States and in the World, and the various transformations necessary to make energy readily available. Along with the transformations and technology, we explore the problems to be faced and the potential for solving these problems in a manner which will have minimal environmental impact.

BEHAVIORAL OBJECTIVE:

At the completion of this unit the students will be able to explain why the sun is the source of all energy.

SUBJECT AREAS:

Science, Art

OPTION #1

MATERIALS AND RESOURCES

Ditto sheet for game board, one per student
Ditto sheet for game cards, one per student

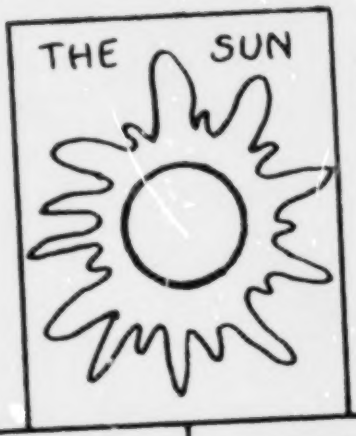
PROCEDURE:

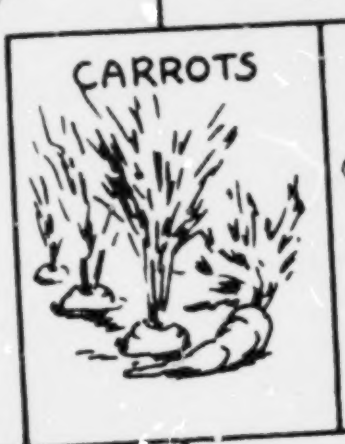
1. Divide the class into groups of four students.
2. Give each group a set of cards, one set for each student, shuffled, and placed in the middle of the board.
3. Each student draws a card in turn.
4. The bottom row must be filled by a player before moving up to the next row.
5. If a player draws a card he cannot yet use he keeps it until he can play it but he does not draw another card.
6. Should a player draw a card already in his possession, he replaces it and loses a turn.
7. The game ends when the first player reaches the sun.

DISCUSSION QUESTIONS

1. Do all the items get energy from someplace?
2. Where does the Sun get energy?
3. Do we need the Sun?
4. Do we need plants?
5. Do we need animals?

GAME BOARD


THE SUN


CARROTS

LETTUCE

RABBIT

SQUIRREL

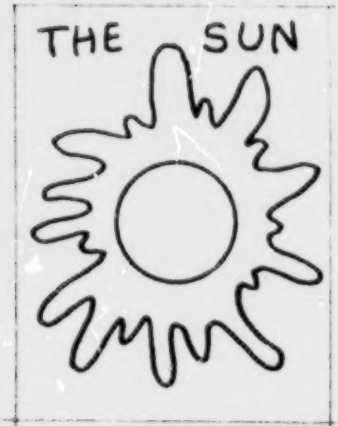
DUCK

BEAR

FOX

EAGLE

ALLIGATOR

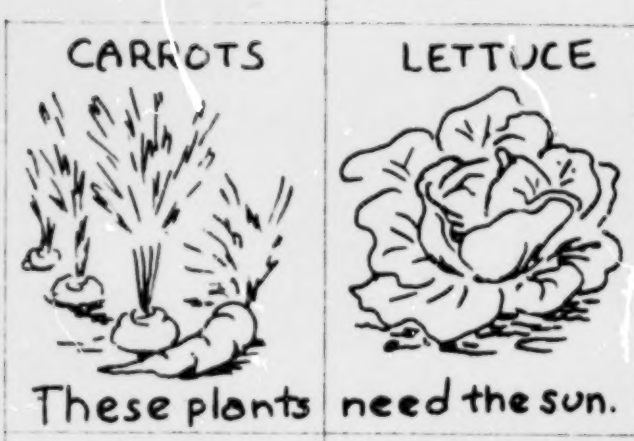


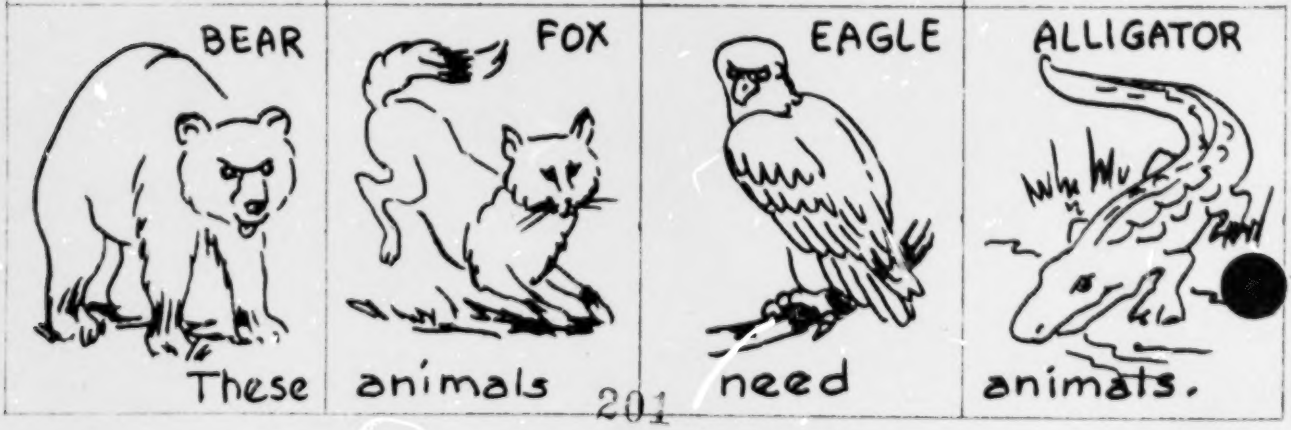
1. Make four copies of the game board and four copies of the game cards for each group of students.

2. The game boards are to be arranged as in the figure below:

3. If the game board is to be permanent, it may be glued to posterboard.

4. Cut out the four sets of cards for each game and place them in the center of the board.





OPTION #2

MATERIALS AND RESOURCES

Gameboard (included in option)
Chips or markers
Dice

PROCEDURE:

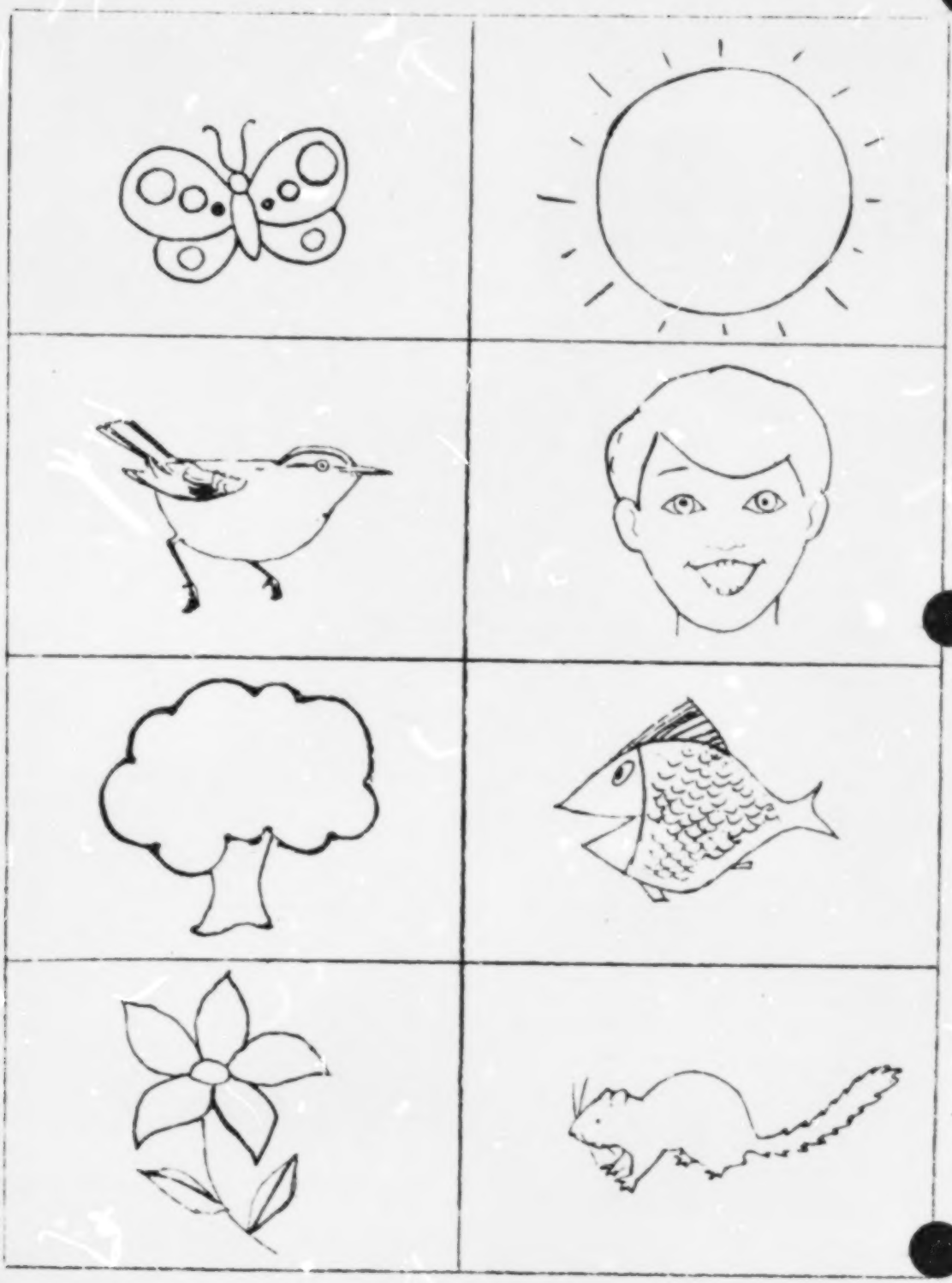
1. Divide the class into groups of four to six students.
2. Each student takes a turn throwing the dice and the game continues until all blocks have a marker.
3. Students can ONLY cover their blocks after the Sun has been covered.
4. Continue the game until someone in each group covers all the blocks.

DISCUSSION QUESTIONS

1. Why must the Sun be covered first?
2. Is there any other block that should be first?
3. Is anything more important than the Sun?
4. Why do we need the sun?

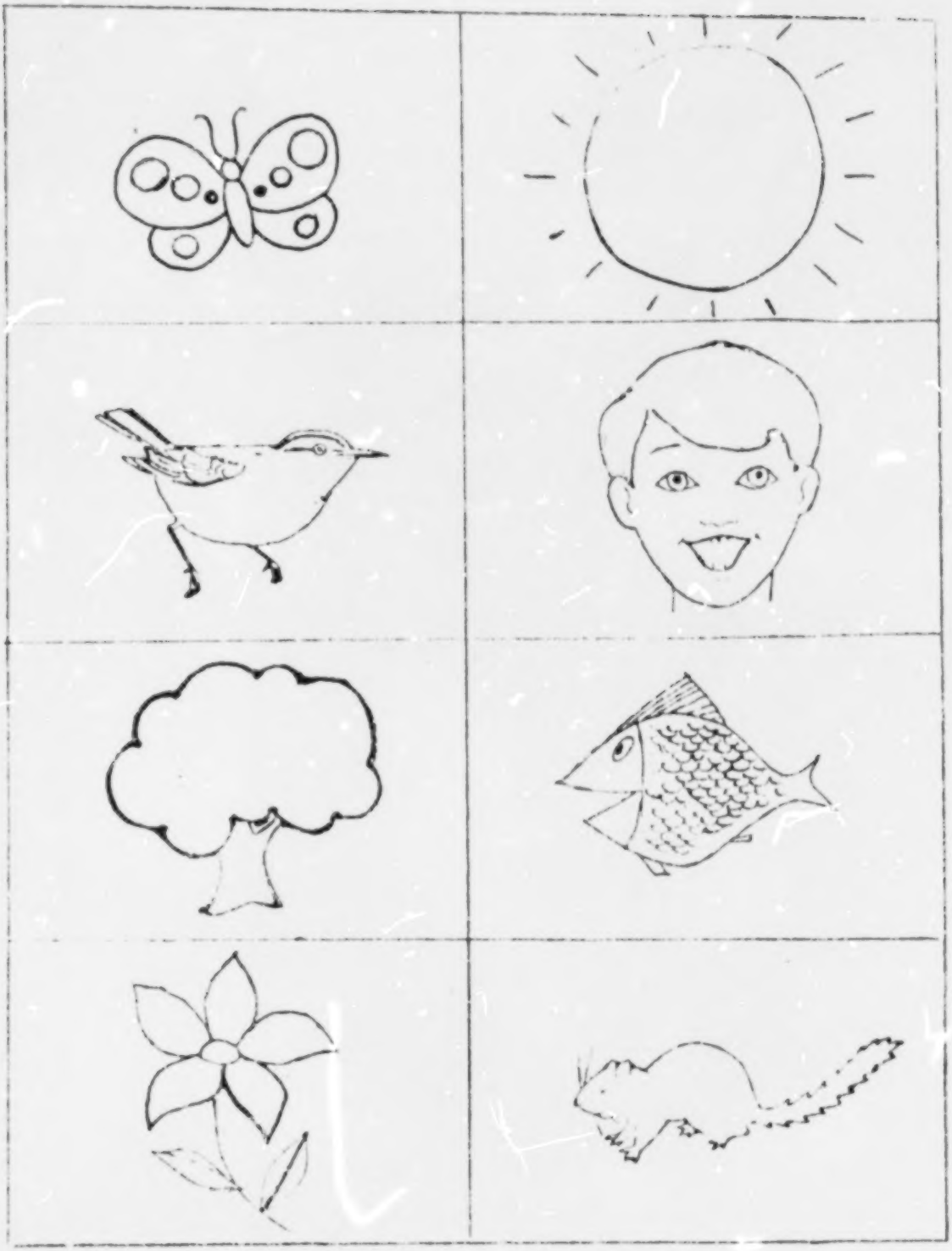
OPTION 2

GAME BOARD



OPTION 2

GAME CARDS



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OPTION #3

MATERIALS AND RESOURCES

Stapler, paper clips
String, paper punch, scissors
Tagboard pieces for each child in the following quantities:

3 11"x2" strips
1 5"x5" square for the SUN
2 4"x4" squares for plants
4 4"x4" squares for animals

PROCEDURE:

1. Distribute seven pieces of tagboard listed above to each child.
2. Color each piece.
3. Staple three strips to form a triangle for the base of the mobile.
4. Punch holes in the three ends.
5. Tie a double length of string through each hole. Half of the string will hang down for the mobile pieces and the other half will be brought to the top and tied with the others to make the hanger.
6. The three suns will be colored, cut, and punched first.
7. The suns will then be attached to each string hanging from the points of the base.
8. Next the plants will be colored, cut, and punched. To each sun attach two plants.
9. The animal pieces will be added last, two animal pieces attached to each plant piece.
10. Hang the mobile with a paper clip.

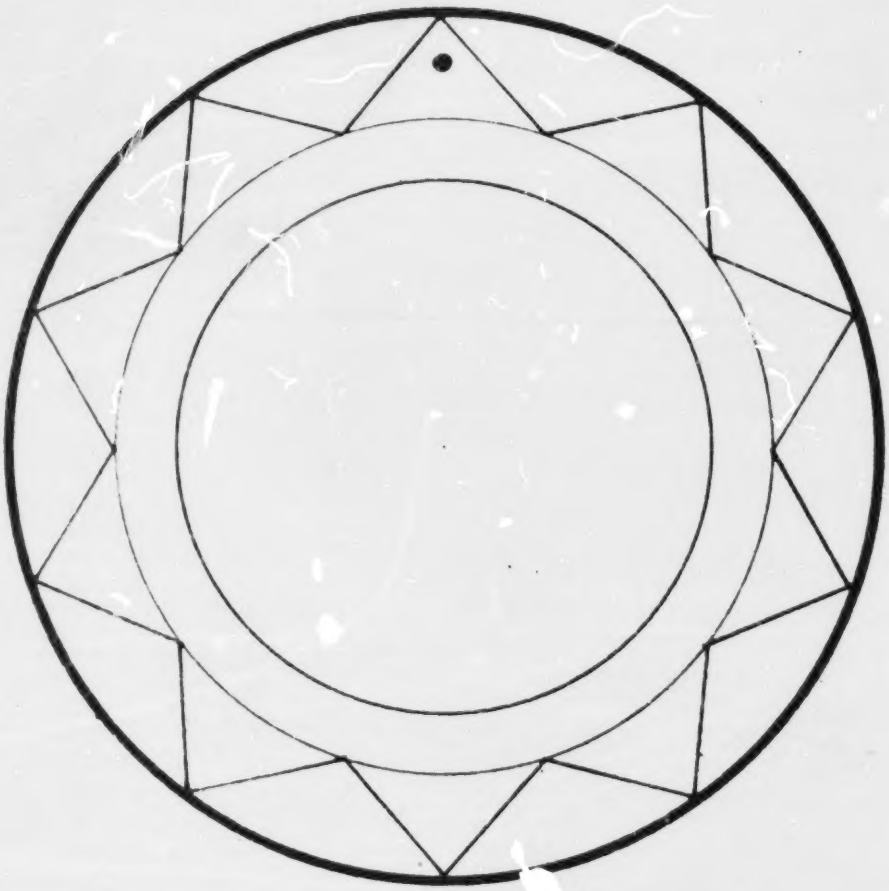
OPTION #3 con't

DISCUSSION QUESTIONS

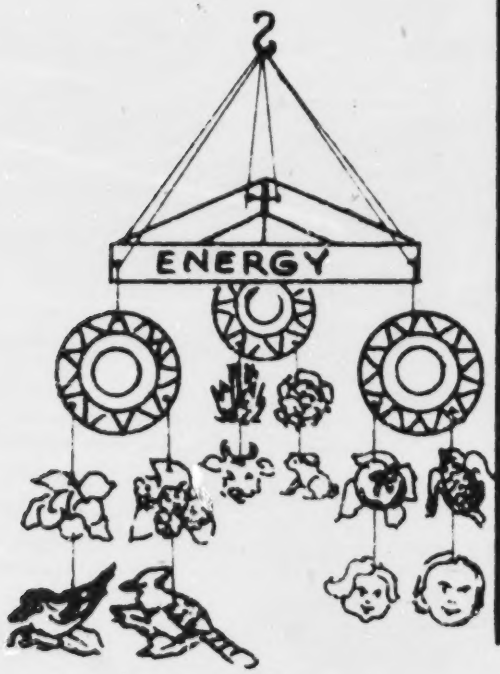
1. Why is the sun the first piece?
2. Why is the sun the most important piece?
3. Why are the plants next and not animals?
4. What does the sun give the plants?
5. What do the plants do for animals?
6. Do animals need the sun?
7. Do people need the sun?
8. Do we give anything to the sun?

OPTION #3

MOBILE

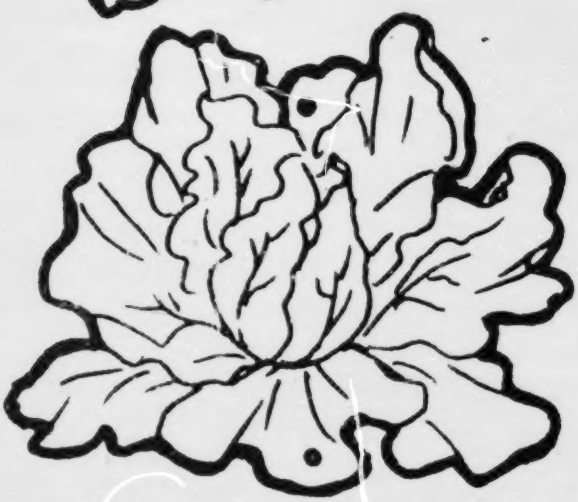


ENERGY



OPTION #3

MOBILE



OPTION #3 MOBILE

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ENERGY 2

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to explain why all living things need energy.

SUBJECT AREAS:

Science, Social Studies

OPTION #1

MATERIALS AND RESOURCES

Three (3) healthy plants all about the same size (Geraniums are good plants to use.)

PROCEDURE:

1. Explain to the class that one plant will be placed on the window ledge, one plant away from sunlight and another will be placed in the closet.
2. Water the plants about every two days; if the room is very dry, you may have to water more often.
3. Have the children observe the plants daily.

DISCUSSION QUESTIONS

1. What changes in the plants were noticed?
2. Why do you think these changes took place?
3. Why did we water the plants?
4. Did any plant get taller than the rest of the plants?
5. Why did the plants need sunlight?

OPTION #2

MATERIALS AND RESOURCES

OPTIONAL - MacDonald's Nutrition Pack

PROCEDURE: Read the following story to the class.

John was on a ship that sank in the ocean. John held onto a crate and managed to reach a small island. He was very weak from being in the water for so many hours but he did manage to get to shore. On the island John will have to decide what to do next.

DISCUSSION QUESTIONS

1. What must he do?

2. What two things made John weak?

3. Why do our bodies need food?

4. What happens if we do not get the food we need?

5. How many of you have ever been weak because of lack of food?

Send me ___ McDonald's Nutrition Pack(s) at $1.00 each
Send me ___ McDonald's Ecology Pack(s) at $1.00 each

Enclosed is $ _____ for postage and handling to partially cover production. Check or money order only, please, payable to McDonald's Action Packs.

MAIL TO:
McDonald's Action Packs
Box 2594
Chicago, Illinois 60690

NAME _____
(please print)
ADDRESS _____
CITY _____
STATE _____ ZIP _____

OPTION #3 - Wintertime

MATERIALS AND RESOURCES

Allyn-Bacon Social Studies - 2nd Grade, Eskimos, available E^2 Office

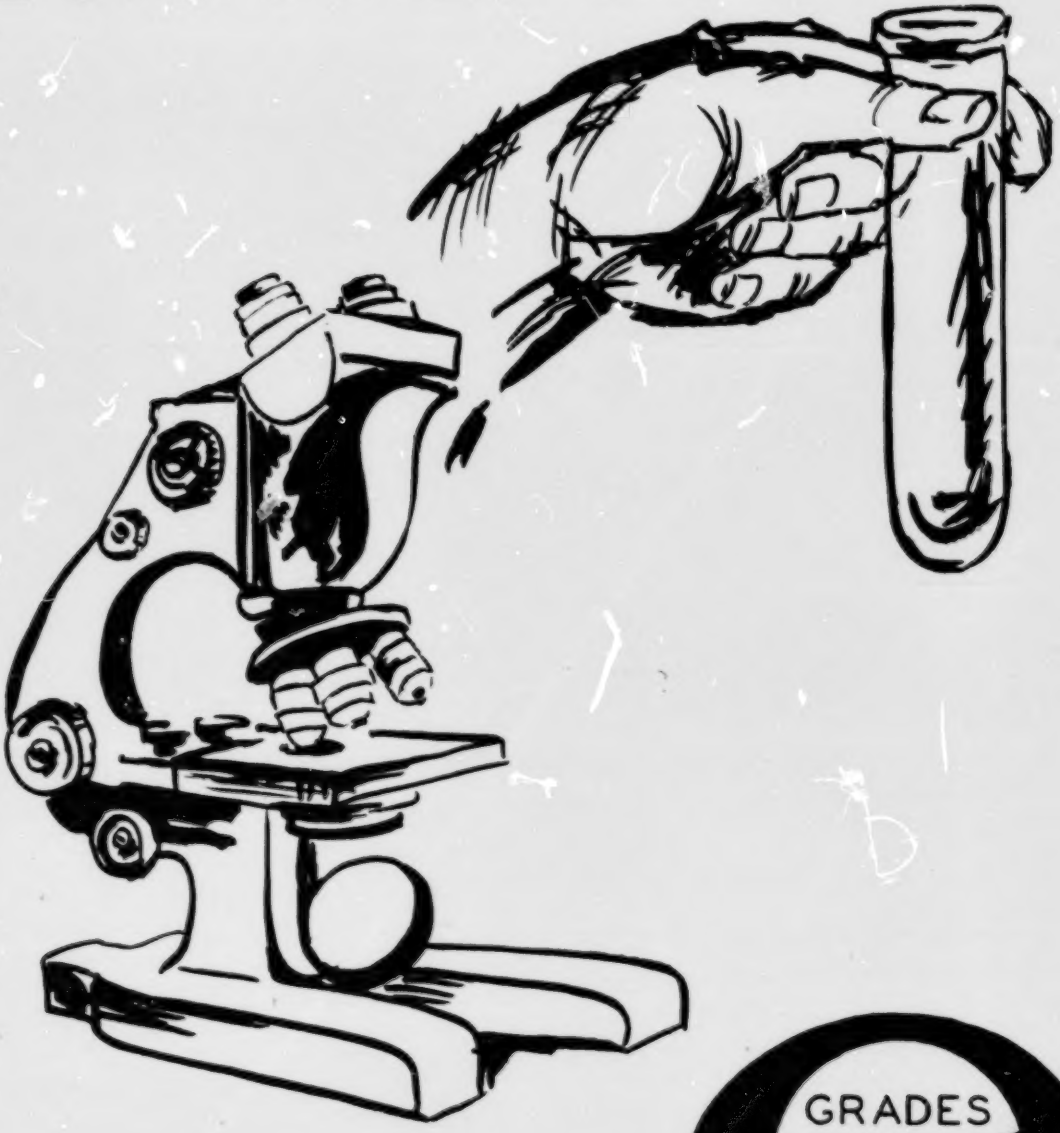
PROCEDURE:

1. Have the students dress to go outdoors. Do this at a recess.
2. Take them outside and watch to see if they are getting cold. Stay out until you hear complaints from the children about the cold.
3. Upon return to the classroom ask the questions listed below:

DISCUSSION QUESTIONS

1. Why were you cold outside?
2. What could we have done to have been warmer?
3. What would have happened if we had not worn our coats?
4. When you run fast do you feel hot in the summer? In the winter?
5. Why do we have to have heat?
6. Have you ever seen an animal curl up to sleep? Why do they do that?
7. Can you think of other things we need?
8. Why do you think you shiver? Do you shiver when you are warm?
9. If animals did not have food would they live through the winter?
10. What if animals have only a little food?
11. Will they be as healthy through the winter?

TECHNOLOGY



GRADES

ENVIRONMENTAL EDUCATION

VALUES FOR THE FUTURE

ANTIOCH COMMUNITY SCHOOL DISTRICT 34

TITLE IVC ESEA

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Explanation of Concept area 1

Time of the Year Notes

Technology 3, Option 1 - Spring or Fall 15

Synopsis

Technology 1: At the completion of this unit the student will be able to explain why people in our country are trained to perform various types of work required by society.

Option 1 - Children use the assembly line principle to perform individual tasks. ... 3
Option 2 - The children use a park layout to learn the functions of an area, then design their own park and discover what jobs are involved in the building and maintenance of recreational areas. ... 5
Option 3 - The children discuss why people work and the types of work after viewing various films on the subject. ... 8

Technology 2: At the completion of this unit the student will be able to explain why industry supplies both necessities and luxuries.

Option 1 - The children use catalogs and advertisements to explain the difference between necessities and luxuries. ... 10
Option 2 - The children make individual lists of necessities and luxuries, first within the classroom, then at home. ... 11
Option 3 - The children take a survey of necessity and luxury items in a store. ... 12

Technology 3: At the completion of this unit the student will be able to explain how inventions have made many changes in our lifestyle.

Option 1 - The children gather natural items to use in making simple tools. ... 15
Option 2 - Children use pictures to chart natural and man-made items.. 16
Option 3 - The children use simple machines versus manpower to see how machines change our lifestyle. ... 17

EXPLANATION OF CONCEPT AREA

TECHNOLOGY - Our vision of technology as a pure good that has brought man from primitive times to our modern litestyle without major difficulties must be expanded to include the negative aspects so that we can understand the danger of taking technology for granted.

In the beginning we deal with the idea of work and our personal needs as supplied by technology.

We then progress to the rate of change of technology and its influence upon our lifestyle and environment.

The students then explore the timeline of technology and how technology is related to the use of resources. Technology is also examined for its effects on the environment.

In high school students examine the role of technology in the development of demand and its relationship to social costs and trade-offs.

TECHNOLOGY 1

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to explain why people in our country are trained to perform various types of work required by society.

SUBJECT AREAS:

Mathematics, Social Studies, Art

OPTION #1

MATERIALS AND RESOURCES

Two packages of paper for each group of children, each package a different color
One tagboard shape for each group and a pencil
One pair of scissors for each group and one stapler for each group also

PROCEDURE:

1. Divide the class into groups of five. Chidlren left over can be recordkeepers who will keep a running tally of the number of shapes made by each group during the construction period.

2. Give two packages of paper (different color) to each group.

3. Assign construction jobs to the members of two of the groups as follows:
One tracer, one cutter, one stapler, one counter, and one sorter

4. The other groups do not have jobs. Each person in the group of five works on his/her own shapes and places them in the center of the group.

5. Provide a tagboard shape for them to trace in each group. A circle or square shape is recommended. You may want to demonstrate how it is done. It is better to assign different shapes to different teams instead of having all teams doing the same thing at once.

6. The construction proceeds like an assembly in two groups and as single projects in the others.

   a. The sorter hands two papers of different colors to the tracer.
   b. The tracer draws the shape, then passes the paper to the cutter.
   c. The cutter cuts the shapes and passes to the stapler.
   d. The stapler staples each two shapes together and passes them to the counter.
   e. The counter then makes stacks of ten.

   Each member of the group works only on his part. NO HELPERS, PLEASE!!!
   It is an assembly line process.

7. Over a five-ten minute period see which group can complete the most of their particular shapes. Make a contest of it and be sure to carefully notice behavior.

DISCUSSION QUESTIONS

1. Which team made the most shapes? Which team make the least?

2. Did the recordkeepers, if any, notice why one team made more shapes than another?

3. Did any of the groups make their shapes better than others?

4. Why was it important that each team member do his job well before passing it along to the next member?

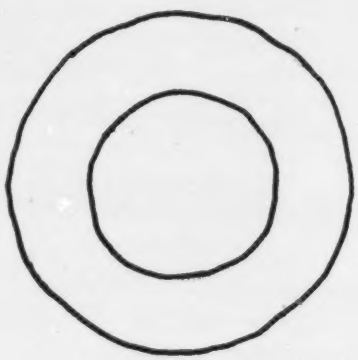
5. What would have happened if one team member didn't do anything at all?

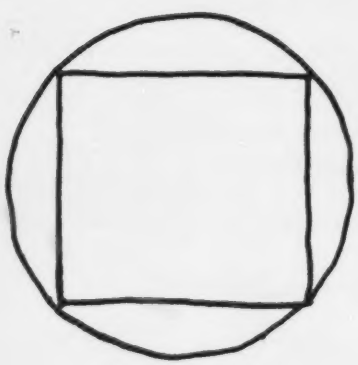
OPTION #1 con't

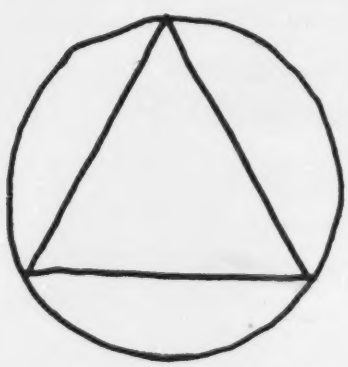
6. What would happen if everyone in the world had only one job to do - be a farmer, a teacher, a football player, etc?

7. Ask the children to think of a cookie. How many jobs have to be done before someone can sit down at home and eat a cookie?

SUGGESTED SHAPES







OPTION #2

MATERIALS AND RESOURCES

Chart and construction paper
Paints, crayons, felt tip markers
Available resource people such as custodians, department of public works representatives, landscape architects, nurseryman, parents
Ditto sheet

PROCEDURE:

1. Have the children leaf through books showing developed playgrounds, see slides and visit any nearby parks to see what things they think make such places inviting and easy to use.

2. Instruct them to think about:

   a. what they like to do most and where in a park.
   b. what they like to do least and areas they dislike the most.
   c. what they do not like to see in the park.
   d. what they would like to add to the park.

3. Using the park map the children can show general areas and equipment with prediscussed symbols. They can draw in their choices in areas needing improvement or cross out areas to be eliminated.

4. Summarize the results with them.

5. Have each child design his/her ideal playground.

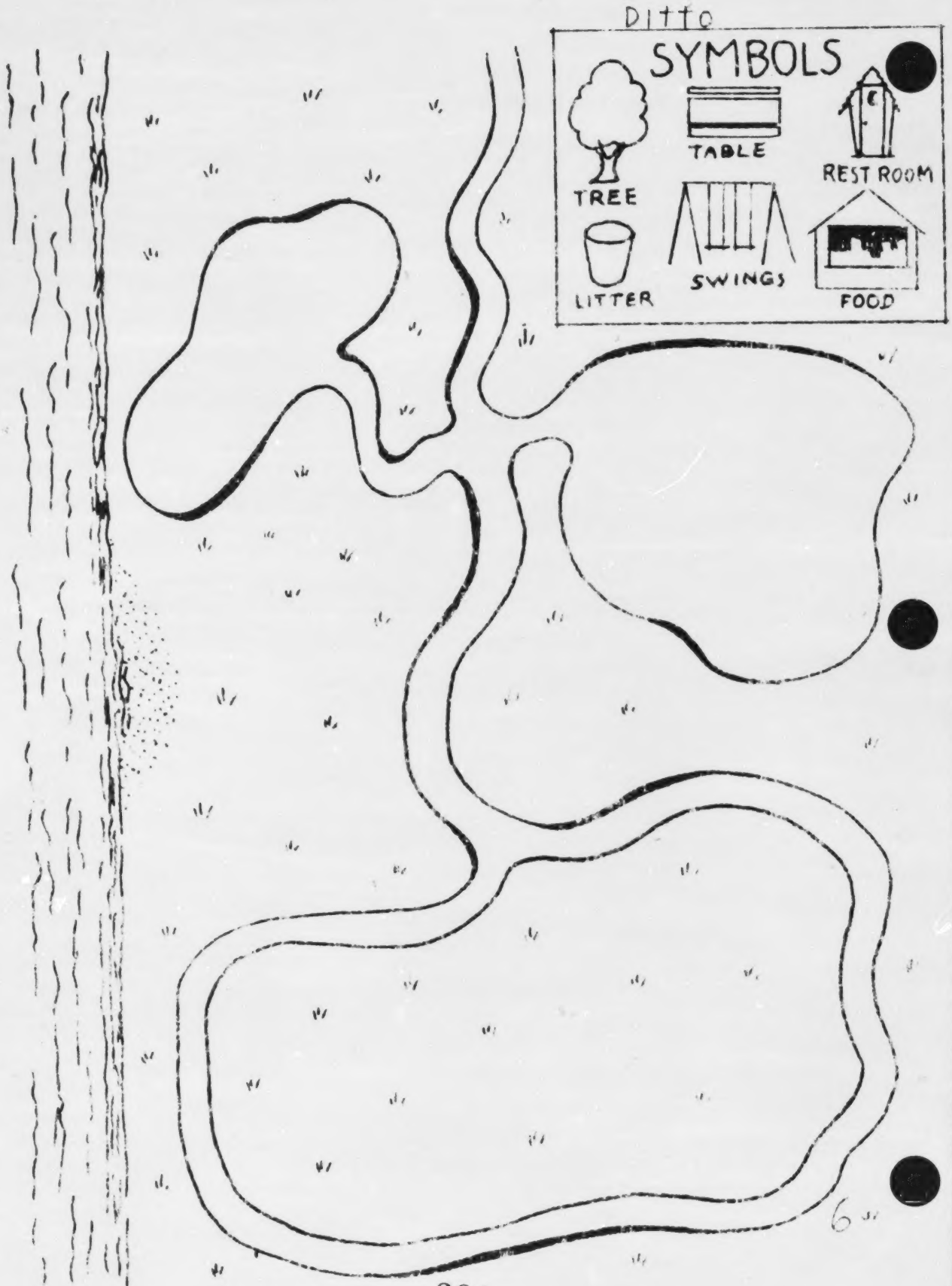
6. Have them interview the custodian about his responsibilities, training and his concerns. Have them think of how many ways they can help solve some of the playground problems identified by working with him (walking on the sidewalk instead of across plantings, sweeping gravel off the asphalt, putting litter in trash cans, etc.).

7. Interview public works department representative regarding solid waste removal. What are their responsibilities? What do they do with the waste? What training do they need? What are their special problems?

8. Interview a landscape architect or a public works nurseryman about their work, training, ideas about public school recreation areas.

9. Interview the principal regarding his job, training, problems in regard to playground equipment, safety of children. Discuss their findings and suggestions with him. Before the interview, help the children compile a list of things they can do to assist in improving the playground. Encourage them to decide on a special project with an alternative that interests them. Discuss expert help they may need to accomplish project.

10. From here on, follow-up activities and projects can involve many more kinds of expertise which will help them gain an understanding of a variety of occupations and the training involved. Throughout the activities whenever parents' expertise and experience can be utilized to demonstrate the concept of the course, it should be included.


Ditto
SYMBOLS
TREE
TABLE
REST ROOM
LITTER
SWINGS
FOOD
6

OPTION #2 con't

QUESTIONS TO BE ASKED WHEN INTERVIEWING WORKERS:

1. What kind of work do you do?
2. Is it indoors or out of doors? Do you travel in your job?
3. Do you use your hands and body a lot? Do you mostly work with ideas?
4. Do you work with people or alone?
5. What kind of training did you need to do your job?
6. What things did you learn in school that helped you with your work?
7. What tools do you use?
8. What hours do you work? Do you decide what these hours are?
9. What do you like about your work? What do you dislike?
10. What are the special problems you find in doing your work?
11. Why did you choose this kind of work?
12. What do you do for fun and to relax?

OPTION #3

MATERIALS AND RESOURCES:

Filmstrips: Community Workers and Helpers, Group 1, 2, or 3 SVE 12 filmstrip/cassettes in the three sets, 4/set

PROCEDURE:

1. List on a chart all of the jobs the childrens' parents do.
2. List any other jobs the children can think of.
3. Bring in any audio-visual media or social studies units you feel will enforce or enrich this concept.

DISCUSSION QUESTIONS

1. Do most people in our country "work"?
2. Do most people in our country do the same work of various kinds or do each of them choose a special job and help each other?
3. Why did the pioneers have to learn how to do so many jobs?
4. Can any of your parents do more than one type of job? What kinds of jobs?
5. How many different jobs are needed in a home?

BEHAVIORAL OBJECTIVE:

At the completion of this unit the student will be able to explain why industry supplies both necessities and luxuries.

SUBJECT AREAS:

Art, Social Studies, Mathematics

OPTION #1

MATERIALS AND RESOURCES

Catalogs from Sears, Wards, Penneys, or Aldens or newspaper advertisements
Scissors
Posterboard
Paste or glue

PROCEDURE:

1. Have the children cut out pictures of items they feel are necessities and also those they feel are luxuries. This can be done in groups of four.

2. Divide each posterboard into two columns, one for necessities and one for luxuries.

3. Have the students paste the pictures under the headings they feel the pictures belong.

4. Put the posterboard on display and have the students explain their work.

DISCUSSION QUESTIONS

1. Which things are necessities?

2. Why are they a necessity?

3. Which things are luxuries?

4. What makes these things or products luxuries?

5. Which products do you think sell the fastest, necessities or luxuries?

6. Why do you think both are sold?

7. Does everyone have necessary items?

8. Does everyone have luxury items?

9. What kind of people have the most luxuries?

OPTION #2 - No specific materials necessary

PROCEDURE:

1. Ask the students to explain what necessities and luxuries are.

2. Have the students make two lists of things found in the room, one of necessities and one of luxuries.

3. Have the students make two additional lists the same way but have them list articles they have at home.

DISCUSSION QUESTIONS

1. What are necessities? What are luxuries?

2. Do you have more necessities or luxuries at home?

3. What determines which you have more of?

4. Why do you think both are made?

5. Do all people have necessities?

6. Do all people have luxuries?

OPTION #3

MATERIALS AND RESOURCES

Necessity and/or Luxury Survey

PROCEDURE:

1. Contact a local food store manager and obtain permission to bring your class to his store for a survey or have each student go shopping with a parent and record luxuries and necessities.

2. Arrange to have room mothers accompany the class. It is best to have one mother for each five or six students.

3. Make bus arrangements if necessary.

4. Students are to survey the store for necessities and luxury items.

5. Students are to make two separate lists under the different headings and it might be interesting to list prices of the different items also. (See survey)

DISCUSSION QUESTIONS

1. Were more luxuries or necessities found in the store?

2. Where were most of the luxury items found?

3. Why do you think both are sold in the store?

4. Which items cost more - necessities or luxuries?

5. Which would you buy first, the necessities or the luxuries?

Ditto

SUPERMARKET SURVEY

LUXURIES	PRICE	NECESSITIES	PRICE
TOTAL NUMBER	TOTAL COST	TOTAL NUMBER	TOTAL COST

BEHAVIORAL OBJECTIVE:

At the completion of this unit the students will be able to explain how inventions have made many changes in our lifestyle.

SUBJECT AREAS:

Social Studies, Art, Science

OPTION #1 - Spring or Fall

MATERIALS AND RESOURCES

Any resource materials on tools
String, yarn, picture wire and any additional materials necessary to fasten together the tools

PROCEDURE:

1. Take a fieldtrip to collect things to make homemade tools.
2. Upon return to the classroom, discuss the meaning of "tool".
3. Begin assembling the articles, for example, stone and stick for a hatchet, hammer or pounder, lever, rake, etc. They will find a need for fastening materials such as those listed above.

DISCUSSION QUESTIONS

1. What is a tool?
2. Why do we need tools?
3. Who made tools?
4. How are they made today?
5. How do they help us?
6. Are there any substitutes for tools? (ruler as a lever)
7. Are the tools you made as good as store-bought tools?
8. Have tools been improved?
9. Are there more tools today than there were when your dad and mom were small?
10. Are power tools better than hand tools?
11. Let's look around our rooms and find tools we use every day - pencil sharpener, faucet handle, door knob, hinges, pulleys, scissors, stapler, punch, paper cutter, staple remover, ruler. How can we do the jobs these tools do?

FURTHER ACTIVITIES

1. Have the children make a tool at home and put it on display at school.
2. Collect something from outdoors that you could use as a tool to create some art. Then create some art.

OPTION #2

MATERIALS AND RESOURCES

Chart paper or posterboard
Groups of pictures falling into the categories of "Made by Nature" and "Made by Man" as suggested below:

NATURAL		MAN-MADE	
Leaf	Tree	Sports equipment	Autos
Nut	Flower	Homes	Stores
Animals	Insects	Clothing	Toys
Humans	Rivers	Factories	Bridges
Storms		Highways	

PROCEDURE:

1. Collect enough pictures for each child to have one.

2. Begin by having the children discussing and sorting the pictures.

3. Help them mount the pictures under the headings, MADE BY MAN and MADE BY NATURE. Display on a bulletin board.

DISCUSSION QUESTIONS

1. Do things made by nature change or stay the same?

2. Do things made by nature hurt us?

3. Can we do anything to stop the things nature makes?

4. When man makes something, does he use nature?

5. Can we ever "use up"nature?

6. What are some machines you know that make things?

7. Do things made by man change or stay the same?

8. Do things made by man hurt us?

FURTHER ACTIVITIES

1. Make crayon rubbings of things made by nature such as leaves, bark, grass, stones, etc. Then do rubbings of man-made things found indoors or out such as bricks, license plates, scissors, metal trim, jewelry, radiator vents, etc. Simply place the object under paper and rub with the flat side of a crayon. Sometimes hard or soft pressure should be applied depending upon the desired effects.

2. Make a list of things we see on the way to school that are man-made or nature made. How many children saw flowers? How many children saw tractors? An experience chart could be made to record their observations.

OPTION #3

MATERIALS AND RESOURCES

Board
Building blocks
Bucket
Pulley
Rope
Toy with wheels
Heavy books or a piece of cinder block or heavy stone

PROCEDURE:

1. Put a heavy load of books or cinder block on a table.

2. Tell the children you want to move it from the table to a place below. How can we do it?

3. Have the board nearby for anyone to use. To avoid the children carrying one book at a time as a solution, place the books in a closed box.

4. If no one uses the board, show them how an inclined plane works by letting them try sliding the heavy load up or down the ramp.

5. Next build a staircase with big building blocks.

6. Have the children try going up and down the staircase with a toy car or buggy, anything with wheels.

7. Ask if someone could use the board in a way that will make it easier.

DISCUSSION QUESTIONS

1. How many people would it take to move a heavy load of books up the steps?

2. Could one person pull them up a plank? One person could pull the load up the small slide on the playground.

3. Have you ever seen a plank used?

4. Have you ever slid down a plank? What else have you slid down?

FURTHER ACTIVITIES

1. Chirdren should go outside and have the janitor show them how he puts the flag up and takes it down by use of a pulley. Does the pull on the rope have the same direction as the rising flag?

2. Make a simple pulley using an empty adhesive or plastic tape round or a spool with a dowel rod or coat hanger as a spoke. Use string to lift. Let the children raise simple objects to see how the pulley does work.

3. Construct some wheels. Make an article that uses wheels. Bring in pictures illustrating the wheels and their uses. Make a display of wheels of various sizes and weights.

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OPTION #3
FURTHER ACTIVITIES con't

MATERIALS AND RESOURCES

Any resource materials on wheels

PROCEDURE:

1. I would mention I needed something round that goes fast. What would you say I needed?

2. Let's think of all the wheels of various sizes that have helped us today.

   Waking up - a clock
   Water faucet knobs
   Door knob
   Stove knob
   Bus or car wheels

3. In our room, let's find the wheels - pencil sharpener, record player, piano on wheels, dolly buggy, toys, trucks, etc.

DISCUSSION QUESTIONS

1. Why are wheels necessary?

2. Do wheels go by themselves? We say wheels "go".

3. Have we always had wheels? What came before wheels?

4. Do you know how the first wheels were made? The first wheels were too heavy so they made wheels with spokes.

5. Were metal wheels stronger? Why do metal wheels have rubber?

6. What sizes of wheels do we have?

7. How many wheels were used by you today?

8. What could we do without wheels?